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STOMACH & DUODENUM

THIS brand new book—*published scarcely two months ago*—has already gone back to press for a large reprint!

This success, we firmly believe, is due to the special consideration and constant emphasis which Drs. George B. Eusterman, Donald C. Balfour and their Associates at the Mayo Clinic have given to the specific problems of the Family Physician as well as those of the internist, the surgeon and the specialist.

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Then, too, they have included chapters on test-meals, significance of the various symptoms, preoperative and postoperative management, interpretation of laboratory findings, technic of securing gastric contents, special diets, etc.

There is a chapter of 50 pages, with 80 skiagrams, on roentgenologic diagnosis; and in addition, the x-ray is discussed under each one of the various diseases. You are given indications, technic of examination, x-ray appearance; sources of error, and other help in the use of this diagnostic aid.

Surgical technic is detailed in the text and graphically shown by clear, instructive, and decidedly helpful illustrations. Many of these 571 illustrations show the operations step by step. Indeed, this new book can be truly called a work on the *actual practice of medicine in the field of gastroduodenal diseases.*

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INTERMITTENT PRESSURE AND SUCTION

IN THE TREATMENT OF CHRONIC OCCLUSIVE ARTERIAL DISEASE

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AND
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ROCHESTER, MINN.

The historical background for the use of alternate suction and pressure in the treatment of vascular disease has been reviewed by Herrmann and Reid.[1] In spite of the fact that such treatment is a century and a quarter old, a great deal of credit is due to Landis and Gibbon [2] and to Reid and Herrmann [3] for reviving it, for perfecting the mechanism by which it is applied, and for testing the value of the treatment both physiologically and clinically. Herrmann and Reid [4] have proposed the name "pavaex" for this treatment, the term signifying passive vascular exercise, and the changes in pressure being gradual. Landis [5] has retained the denotation "alternate pressure and suction," the changes in pressure being sudden. At the clinic, we have used the unit devised by Herrmann and Reid since February 1934. In the present paper we attempt to evaluate this therapeutic procedure from a review of cases in the literature in which it was used and from a survey of our own experiences with it. Unfortunately, there have appeared from nonmedical sources extremely enthusiastic reports. These have made imperative a sound survey based on actual clinical trial.

REVIEW OF LITERATURE

Physiologic Studies of Normal Subjects and Studies on a Circulation Schema.—Alternate suction and pressure in the treatment of occlusive vascular disease has a physiologic basis. Landis and Gibbon have shown that it increases the flow of water through a circulation schema. The results seem to be based on Pouiselles' law that the amount of fluid flowing through a rigid tube depends on the fall of pressure along that tube. Landis and Gibbon further demonstrated that the rate at which the extremities of normal subjects cooled when such subjects were placed in a cool environment was slowed by the changing environmental pressure. They found, likewise, that the warmth of cool extremities of normal subjects was increased by alternating suction and pressure.

Studies on Patients with Occlusive Arterial Disease; Surface Temperature.—Landis and Gibbon studied five patients with occlusive arterial disease. The average rise in the temperature of the digits exposed to suction and pressure was 7.1 degrees C., whereas the temperature of the opposite extremity increased on an average of 1.9 degrees C. Subsequently, Landis reported observations of sixteen patients with occlusive arterial disease. The digits of feet exposed to alternate pressure and suction became warmer by an average of 7.6 degrees C., whereas the rise in temperature of opposite extremities averaged 1.8 degrees C. In several publications Herrmann and Reid also reported an increase in the temperature of the skin of subjects with occlusive arterial disease, although definite figures were not given. Reid [6] likewise reported an increase in the temperature of the skin. The duration of this increase in temperature of the skin as a result of treatment persists about seventy-two hours according to Herrmann and Reid,[4] although there is a gradual diminution in the surface temperature after about twelve hours. Landis stated that the hyperemia is maintained for several hours. Evidence that vasodilatation persists permanently after discontinuance of treatment has not been presented, although Landis stated that it usually becomes more and more lasting as treatment continues. Herrmann and Reid reported that they had no information concerning the permanence of the increase in temperature.

Effect on Pain.—There are four common types of pain observed in chronic occlusive arterial disease.[7] Intermittent claudication is distress produced by exercise which is relieved by rest. Rest pain is a more or less constant distress occurring independent of exercise. We recognize three main types: (1) that in the region of ulceration or gangrene, (2) that associated with ischemic neuritis, and (3) that following sudden arterial occlusion, which appears to be due to widespread arterial spasm. Unfortunately for attempts at evaluation, references in the literature are all too frequently vague as regards type of pain. Statements made were that the major symptoms were relieved or that the patients were subjectively improved. Such statements confuse the issue and make true evaluation difficult.

Pain of Ulceration or Gangrene: Landis reported that four patients with frank gangrene or large sloughing ulcers received little or only temporary benefit. Amputation was necessary in all four cases. Seven

Dr. George E. Brown died Nov. 28, 1935.

From the Division of Medicine, the Mayo Clinic.

1. Herrmann, L. G., and Reid, M. R.: The Conservative Treatment of Arteriosclerotic Peripheral Vascular Diseases, Ann. Surg. **100:** 750-760 (Oct.) 1934.

2. Landis, E. M., and Gibbon, J. H.: The Effects of Alternate Suction and Pressure on Blood Flow to the Lower Extremities, J. Clin. Investigation **12:** 925-961 (Sept.) 1933.

3. Reid, M. R., and Herrmann, L. G.: Treatment of Obliterative Vascular Diseases by Means of Intermittent Negative Pressure Environment, J. Med. **14:** 200-204 (June) 1933.

4. Herrmann, L. G., and Reid, M. R.: Pavaex (Passive Vascular Exercise) Treatment of Obliterative Arterial Diseases of the Extremities, J. Med. **14:** 524-529 (Dec.) 1933.

5. Landis, E. M.: Observations on the Diagnosis and Treatment of Peripheral Vascular Disease, Ann. Int. Med. **8:** 282-295 (Sept.) 1934.

6. Reid, M. R.: Diagnosis and Treatment of Peripheral Vascular Diseases, Am. J. Surg. **24:** 11-35 (April) 1934.

7. Goldsmith, Grace A., and Brown, G. E.: Pain in Thrombo-Angiitis Obliterans, Proc. Staff Meet., Mayo Clin. **9:** 201-202 (April 4) 1934.

patients with indolent or slowly enlarging ulcers were entirely or almost entirely relieved of pain. De Takáts [8] reported that all his patients afflicted with rest pain were promptly relieved but that the pain returned when treatment was discontinued. Shipley and Yaeger [9] reported prompt relief in two cases. Landis and Hitzrot [10] reported total relief of pain in regions of ulceration in five of six cases of diabetes and arteriosclerosis, and improvement in one case. In the same condition, rest pain unassociated with trophic lesions was relieved entirely in four cases and was improved in one case. Of seven cases of thrombo-angiitis obliterans, pain associated with ulceration was relieved permanently in three cases and improved in two cases; in the two remaining cases, pain was relieved only during a period of treatment. In an additional case of thrombo-angiitis obliterans, rest pain that was not associated with ulceration was relieved. In two of three cases of arteriosclerosis with ulceration, pain was relieved; in one case, relief was experienced only during a treatment.

Pain Associated with Sudden Arterial Occlusion: Herrmann and Reid [1] reported ten such cases, in all of which pain was relieved promptly. De Takáts specifically noted relief in one of his cases and stated that all patients with rest pain were relieved during treatment.

Intermittent Claudication: Landis noted lengthening of the walking distance before claudication occurred in five of six cases. In de Takáts' series no improvement was noted in cases of thrombo-angiitis obliterans, but increased tolerance to distance was noted in four cases of "endarteritis obliterans." Landis and Hitzrot noted improvement in claudication in two of three cases of diabetes and arteriosclerosis and all six cases of thrombo-angiitis obliterans. Herrmann and Reid reported complete relief in one case of sudden arterial occlusion.

Inadequately Defined Pain: Shipley and Yaeger reported subjective improvement of three patients. Herrmann and Reid [1] reported complete relief in three of nineteen cases; in eight cases there was improvement, and in eight others improvement was not noted. In all these cases a diagnosis of "predominant involvement of the arterioles of the feet" was made. In forty-six cases a diagnosis of "predominant involvement of the secondary arterial pathways" was made, and in twenty cases it was reported that patients were "completely relieved of all major symptoms." Twenty-two additional patients were "greatly improved" as far as pain was concerned.

Effect on Frank Gangrene.—The affected extremities of all four of Landis's patients required amputation. Herrmann and Reid [1] reported that 16 per cent of sixty-five patients with "predominant involvement of secondary arterial pathways," and "predominant involvement of the arterioles of the feet" due to arteriosclerosis, required amputation of the affected extremities. Gangrene seemed to be definitely limited, and in some instances amputation was possible at a lower level as a result of treatment. All ten patients who had sudden arterial occlusion, some of whom might reasonably be expected to have gangrene later, avoided it as a result of treatment. Three patients with sudden arterial occlusion observed by de Takáts did not show improvement as far as the gangrene was concerned.

Effect on Indolent Ulcers.—De Takáts reported the healing of an ulcer in a case of "endarteritis obliterans" and the marked tendency of another ulcer to heal in a case of arteriosclerosis obliterans. Shipley and Yaeger reported the healing of ulcers in a case of thrombo-angiitis obliterans and in another case of thrombo-arteriosclerosis obliterans. Landis noted no improvement in the appearance of gangrenous sloughs in two cases of thrombo-angiitis obliterans and only temporary improvement in one case of thrombo-arteriosclerosis obliterans. In four cases of thrombo-angiitis obliterans and in three cases of thrombo-arteriosclerosis obliterans, indolent ulcers healed. Landis and Hitzrot reported acceleration of or complete healing in eight cases of arteriosclerosis and diabetes; amputation was necessary in one case because of osteomyelitis and in one case because of a persistent slough and necrosis of a toe that occurred six months later. Ulcers healed entirely or markedly in four of six cases of thrombo-angiitis obliterans, amputation being necessary in the other two cases, and ulcers healed in two of three cases of arteriosclerosis, amputation being necessary in the third case.

From these reported observations, one can draw the conclusions that the surface temperature of the treated extremity usually increases significantly during a treatment and that the duration of this increase has not been definitely determined. As yet no definite evidence has been presented that permanent vasodilatation has been induced by repeated treatment. Indolent ulcers may heal as a result of treatment. Rest pain is usually relieved while the patient is receiving treatment, but it frequently returns; in some cases the pain disappears more or less permanently. Claudication is usually benefited. Gangrene can be avoided in cases of sudden arterial occlusion if the patients are treated soon after occlusion occurs.

EXPERIENCE AT THE MAYO CLINIC

Sixty patients have been treated at the clinic with the passive vascular exercise unit, thirty-two of these over sufficient periods to allow some evaluation of the method. Sixty or eighty millimeters of negative and 20 mm. of positive pressure (four cycles to each minute) were used as a routine procedure. All patients were confined to the hospital and only minimal activity was allowed. Those with gangrene or ulceration received anodynes and alcohol, anesthetics and stimulants to epithelial growth were applied locally, as needed, and foot soaks of saturated boric acid were given. Most of the patients took postural exercises and the feet were kept warm in a cradle or cabinet by heat from carbon filament bulbs. Additional treatment given is indicated in the accompanying tables. In these tables and in the discussion that follows, the terms "ischemic neuritis" and "trophic pain" are used to describe conditions as indicated by Goldsmith and Brown.

Ischemic Neuritis.—Seven patients with thrombo-arteriosclerosis obliterans and four with thrombo-angiitis obliterans were treated at the clinic (table 1). In all but two cases pain was relieved during a period of treatment. In these two cases, distress was increased by treatment and could not be tolerated. Of the nine other patients who obtained relief during a period of treatment, three were permanently and completely

8. de Takáts, Géza: Obliterative Vascular Disease: Preliminary Report on Treatment by Alternating Negative and Positive Pressure, J. A. M. A. **103**: 1920-1924 (Dec. 22) 1934.

9. Shipley, A. M., and Yaeger, G. G.: Passive Vascular Exercise in the Treatment of Peripheral Circulatory Disease, Surg., Gynec. & Obst. **59**: 480-485 (Sept.) 1934.

10. Landis, E. M., and Hitzrot, L. H.: The Clinical Value of Alternate Suction and Pressure in the Treatment of Advanced Peripheral Vascular Disease, Am. J. M. Sc. **189**: 305-325 (March) 1935.

TABLE 1.—*Effect of Passive Vascular Exercise on Pain in Ischemic Neuritis in Seven Cases of Arteriosclerosis Obliterans and in Four of Thrombo-Angiitis Obliterans*

Case	Arteries Completely Occluded*	Pain of Ischemic Neuritis, Grade	Duration of Treatment	Other Treatment†	Results
		Arteriosclerosis Obliterans			
1.	Right: F, P, DP, PT	2	11 hours in 8 days	.....	Complete relief of pain
2.	Right: DP, PT Left: DP, PT	1	14 hours in 9 days	.....	Relief of pain during treatment but returned each time in about 3 hours
3.	Right: DP, PT Left: P, DP, PT	2	27 hours in 26 days	.....	Pain relieved 65 per cent‡
4.	Right: P, DP, PT	2	51 hours in 33 days	.....	Complete relief during treatment; pain returned in 2 to 5 hours (no permanent pain relief)
5.	Left: F, P, PT, DP	4	154 hours in 59 days	Irradiation of lumbar spine with roentgen rays	Complete relief during treatment; pain returned in 15 to 60 minutes; pain relieved permanently, about 50 per cent
6.	Right, P, DP, PT Left: DP, PT	2	.....	.....	Pain made worse
7.	Left: P, DP, PT Right: DP, PT	2	8 hours in 14 days	.....	Pain relieved during treatment; permanent relief 65 per cent
		Thrombo-Angiitis Obliterans			
8.	Right: amputation Left: P, PT, DP	2	16 hours in 10 days	4 injections of typhoid vaccine	Marked relief of pain
9.	Right: amputation Left: P, DP, PT	3	15 hours in 15 days	Irradiation of lumbar spine with roentgen rays; four injections of typhoid vaccine	Almost complete relief of pain, which recurred in 6 weeks and was again almost completely relieved by same treatment
10.	Right: PT, DP Left: PT	2	.....	.....	Made pain worse
11.	Right; amputation	2§	7 hours in 7 days	6 intravenous injections of typhoid vaccine	54 days of treatment; pain entirely relieved; ulcer almost healed

* Right and left apply to the right and left legs, respectively, and F, P, DP and PT to the femoral, popliteal, dorsalis pedis and posterior tibial arteries respectively.
† This treatment is in addition to the routine treatment employed at the clinic, referred to in the text.
‡ Percentages are only rough estimates.
§ Small ulcer on left internal malleolus.

TABLE 2.—*Effect of Passive Vascular Exercise on Trophic Changes and Associated Pain in Thrombo-Angiitis Obliterans*

Case	Arteries Completely Occluded*	Trophic Changes	Rest Pain, Grade	Duration of Treatment	Other Treatment†	Results
12.	Left: amputation Right: F, PT, P, DP	Indolent ulcer over right internal malleolus	1	26 hours in 28 days	1 intramuscular injection of sulfur in oil	Complete relief of pain; almost complete healing of ulcer
13.	Left: DP, PT Right: DP, PT	Gangrene right first and second toes	3	64 hours in 48 days	16 intravenous injections of typhoid vaccine in 70 days	Almost complete relief of pain; gangrene dry and well demarcated
14.	Right; DP Left: DP, PT	Unhealed, amputation wounds and left first and fifth toes; gangrene left third and fourth toes	0	.....	Amputation‡ left fourth toe on thirteenth hospital day and of left second and third toes on forty-eighth hospital day	Healing complete on seventy-eighth day
15.	Left: P, DP, PT Right: DP, PT	Ulcer in nail-bed of right first toe	2	54 hours in 27 days	3 intravenous injections of typhoid vaccine	Complete relief of pain during treatment; no permanent benefit; ulcer unimproved
16.	Right: DP, PT	2 ulcers base left first toe and gangrene distal third of toe	2	29 hours in 17 days	7 intravenous injections of typhoid vaccine in 28 days	Complete relief of pain during, and from 1 to 6 hours after treatment; no permanent relief; 1 superficial ulcer healed; gangrene unaffected
17.	Right: DP	Large ulcer on right first toe and small ulcer on right fifth toe	1	47 hours in 51 days	7 intravenous injections of typhoid vaccine	Total treatment 93 days; pain entirely relieved; ulcer almost entirely healed
18.	Right: P, PT, DP Left: P, PT,DP	Ulcer on left fifth toe	2	.....	.....	Pain increased by treatment
19.	Right: P, PT, DP Left: P, PT, DP	Gangrene of right fourth toe	2	.....	.....	Pain increased by treatment
20.	Right: P, PT, DP Left: P, PT, DP	Ulcer on dorsum of right foot	2	34 hours in 26 days	Repeated intravenous injections of typhoid vaccine; peripheral neurectomy; sympathectomy	No relief of pain; ulcer progressed in size
21.	Right: F, P, DP, PT Left: P, DP, PT	Ulcer on outer side of left foot	3	28 hours in 14 days§	.....	No benefit
22.	Right: amputation Left: P, DP, PT	Gangrene of left first, second, third and fourth toes	2	6 hours in 12 days	Intravenous injections of salt solutions and typhoid vaccine	Pain increased by treatment; gangrene not benefited; amputation necessary
23.	Right: DP Left: P, DP, PT	Gangrenous ulcers on left first toe	2	70 hours in 27 days	6 intravenous injections of typhoid vaccine; two intravenous injections of hypertonic salt solution	No benefit; amputation necessary

* Right and left apply to the right and left legs, respectively, and F, P, DP and PT to the femoral, popliteal, dorsalis pedis and posterior tibial arteries, respectively.
† This treatment is in addition to the routine treatment employed at the clinic, referred to in the text.
‡ Lumbar sympathectomy four months before.
§ Elsewhere.

relieved and four were permanently relieved to a degree of about 50 to 75 per cent. In two cases relief was experienced only during active treatment, but pain returned shortly after the extremity was removed from the glass boot.

Trophic Pain.—Six of the twelve patients with thrombo-angiitis obliterans experienced permanent relief of pain (table 2). In three cases pain was increased by treatment and in three cases it was unchanged. Trophic pain was present in five of the seven cases of thrombo-arteriosclerosis obliterans; relief was experienced in three and absent in two of these cases (table 3).

Trophic Changes and Gangrene.—Of the ten patients with thrombo-angiitis obliterans who could tolerate the method, four had very marked improvement of gangrene or ulcers and six had none. Two of the four patients who were markedly benefited received repeated intravenous injections of typhoid vaccine; the one with digital gangrene and ulceration had normal pulsations in the posterior tibial artery. The prognosis in this type of case is almost invariably good. Marked benefit was noted in trophic changes in five of the seven cases of thrombo-arteriosclerosis obliterans. The most conspicuous failure was in the last case. In spite of almost ten weeks of treatment, a small superficial ulcer progressed, eventually necessitating amputation. In all the cases in which improvement was noted, the lesions at the beginning were minimal.

Amputation was necessary in all of three cases of sudden arterial occlusion because of gangrene. Two patients were referred to us and passive vascular exercise was begun on the second and sixth days, respectively, after the onset of the condition. Progressive gangrene developed in one case following sudden arterial occlusion, in spite of almost continuous treatment begun only eight hours after the occlusion occurred. Pain was completely relieved.

One patient had frozen his fingers severely while lying intoxicated in the snow for an unknown period of time in subzero weather. Seventy-five hours of treatment in fifteen days did not in any regard avoid the necessity for amputation of the digits.

Intermittent Claudication.—Three patients with thrombo-angiitis obliterans were specifically tested for evidence of improvement of claudication. A standard test was used. The patients walked at the rate of 120 steps a minute until they could not continue. They received, respectively, twenty-six, eighteen and forty-three hours of treatment. No benefit was noted.

Pain Associated with Sudden Arterial Occlusion.—Two patients with sudden arterial occlusion were treated on the second and sixth days, respectively, after the onset of the condition. In both cases pain and discoloration of the foot were increased by treatment. One patient who had sudden arterial closure about eight hours before treatment was begun was completely relieved of pain but gangrene occurred.

Skin Temperature.—Determinations of the temperature of the skin of thirty-five patients were made before and after sixty-eight treatments. The average temperature before treatment was 29 C. (84.2 F.) and the average at the end of the sixty-eight treatments was 31 C. (87.8 F.), a net gain of 2 degrees C. The increase in the temperature of the skin as a result of treatment doubtless would have been larger if temperatures at the beginning of the treatments had been less than 29 C. The significance of these readings of skin temperature is vitiated somewhat by the fact that, while the room temperature varied within normal limits, it was not constant. The duration of the increases in temperature was not definitely determined, but it was less than twenty-four hours, for almost without exception the temperature twenty-four hours after completion of treatment was approximately the same as when treatment was begun. In no instance was there evidence of a permanent increase in the temperature of the skin as a result of repeated treatments.

Comparison of Results of Passive Vascular Exercise with Those of Other Methods.—As a preliminary it is well to state that occlusive arterial diseases, especially thrombo-angiitis obliterans, are notoriously subject to exacerbations and remissions, to periods of quiescence and activity. Even those most experienced in caring for patients with these diseases may have difficulty in determining what results follow natural changes in the course of the disease and what results are induced by artificial means. Experience with a large number of patients is helpful.

The chief aim of all treatment is preservation of affected limbs. Too frequently overlooked, however, is the fact that in many instances amputation is the happiest solution when it obviates long periods of disability and expensive and frequently unfruitful treatment. Any treatment, to be of great value, must therefore produce reasonably prompt results. The average patient cannot afford the money or the time for daily treatments over a period of months, and he usually prefers having his diseased leg replaced with a wooden one so that he can return promptly to work.

TABLE 3.—*Effect of Passive Vascular Exercise on Trophic Changes and Associated Pain in Thrombo-Arteriosclerosis Obliterans* *

Case	Arteries Completely Occluded†	Trophic Changes	Rest Pain, Grade	Duration of Treatment‡	Results
23.	Right: P, DP, PT Left: P, DP, PT	Small ulcer on left first toe	0	43 hours in 30 days	Ulcer healed
24.	Right: DP	Permanent cyanosis of left second toe with moderate edema	2	22 hours in 12 days	Complete relief of pain; almost complete recovery of toe
25.	Right: DP, PT Left: DP, PT	Small ulcer on heel	0	6 hours in 5 days	Ulcer healing
26.	Right: DP, PT Left: DP, PT	Superficial denudation of left second and third toes	1	15 hours in 8 days	Complete relief of pain; denudation improved
27.	Right: amputation Left: DP, PT	Ulcer on left fourth toe	2	20 hours in 17 days	No benefit
28.	Right: DP, PT Left: DP, PT	Infarction right first toe	1	18 hours in 9 days	No relief of pain; toe improved
29.	Left: amputation Right: DP, PT	Ulcer on medial side of right first toe	1	116 hours in 66 days	Progression of ulceration; amputation necessary

* Diabetes in cases 25 and 29.
† Right and left apply to the right and left legs, respectively, and F, P, DP and PT to the femoral, popliteal, dorsalis pedis and posterior tibial arteries, respectively.
‡ Includes routine methods of treatment used at the clinic.

It is well to attempt comparison of results that follow the use of intermittent suction and pressure with those that follow other types of treatment. Increases in surface temperature can be accomplished by the artificial induction of fever, by immersion of the hands in warm water, and by the ingestion of alcohol, theobromine and mecholin. All these methods are simpler than treatment with alternate suction and pressure. One may reason, logically, that unusual benefit will ensue from treatment with alternate suction and pressure only if the increase in circulation is permanent, since similar increases can be induced temporarily by simpler methods.

Permanent relief of rest pain, if effected, is a distinct attribute of the method. Barker, however, reported that as a result of treatment of thrombo-angiitis obliterans with typhoid vaccine there was a complete or almost complete relief in 86 per cent of twenty-eight cases in which rest pain was present but in which there were no trophic changes, and in 73 per cent of fifty cases in which rest pain was associated with trophic ulcers. In 65 per cent of forty-six cases of gangrene limited to digits, and in 25 per cent of cases of massive gangrene, pain was likewise relieved by typhoid vaccine. Permanent relief of pain by section of peripheral nerves has been reported by Laskey and Silbert.[11]

The good results reported in sudden arterial occlusion are encouraging, but Denk[12] reported almost equally good results from intravenous injection of a papaverine substitute. In one case observed by Allen and MacLean,[13] papaverine was injected intravenously, with good results. It is well known that about one half of patients with sudden arterial occlusion recover when very simple methods of treatment are used. The report of Herrmann and Reid that all ten patients recovered when the alternate suction and pressure method was used indicates a distinct advance. Two of our three cases cannot be considered fair tests, as occlusion had taken place too long before treatment was begun. The relief of intermittent claudication is also of great interest. Careful investigation of many patients with this symptom has indicated that the patient's statement is commonly unreliable. Accurate tests should be carried out. We determine the distance at which claudication occurs by walking patients at a standard pace of 120 steps each minute. The distance at which claudication causes the patient to stop is frequently found to exceed by many times that which the patient states. Even under these carefully controlled conditions, Barker, Brown and Roth[14] have found that tissue extracts influence claudication beneficially. Barker has also shown that repeated injections of typhoid vaccine cause improvement in this symptom in about 53 per cent of cases of thrombo-angiitis obliterans; however, the results were not checked by the standard test.

In our experience with about 2,000 cases of thrombo-angiitis obliterans and thrombo-arteriosclerosis obliterans, healing of indolent ulcers has been observed very commonly without the benefit of passive vascular exercise. These good results have partly been the result of repeatedly induced vasodilatation, partly the result of rest. The latter is a very important factor. The trauma to feet during ordinary activity is enormous, and no method of treatment can be evaluated truly unless some measuring stick for the beneficial effect of rest is used or unless the patients are ambulatory. Worthy of mention is Samuel's[15] report of twelve cases of gangrene or ulceration in thrombo-angiitis obliterans in which healing and relief of pain followed a regimen of rest in bed, cessation of smoking, the intravenous injection of salt solutions, and surgically attained cleanliness. Barker[16] reported excellent to slow healing of ulcers in 86 per cent of cases of thrombo-angiitis obliterans, apparently as a result of treatment with artificial induction of fever. The common denominator of many types of treatment is rest in bed, and it is our opinion that this is the most important phase of all successful therapeutic procedures.

Even successful amputation of toes, or of the foot, has been observed on occasions, and the fact that such procedures are successful following passive vascular exercise is not proof of cause and effect unless the percentage of successes is greater than can ordinarily be expected. Such evidence is as yet not available.

The term "collateral circulation" is frequently used in considering chronic occlusive arterial disease. One gains the impression that the term refers to circulation that occurs through newly developed arteries. One of us[17] has reviewed evidence elsewhere that these are not new arteries in an anatomic sense but only in the physiologic sense. In other words, development of collateral circulation is not a process of initiating new arteries to grow in situ but of causing arteries already present to function at a higher physiologic level. Experimental work has indicated that control of the level of function of collateral arteries is largely if not entirely under control of the sympathetic nervous system. An increase in the temperature of the skin is commonly accepted as the best evidence of an increase in the collateral circulation. Sympathectomy remains, then, the best method of increasing circulation through collateral arteries. When sympathectomy is performed, it increases the blood flow to an extremity to an exceptional degree, a result superior to that following any other procedure if degree and permanence are considered together. However, sympathetic neurectomy is inadvisable when gangrene or large ulcers are present.

COMMENT

Evaluation of the results of treatment in medicine is usually difficult, and it is too optimistic to expect any remarkable unanimity of opinion regarding any therapeutic procedure. One thing appears quite certain: the alternate suction and pressure method of treatment has not produced any results that have not been observed repeatedly as a result of simpler methods. Do good results follow passive vascular exercise more frequently than other methods of treatment? We have no answer to this question, and no conclusions can be drawn from reports in medical literature. Do good results follow treatment with intermittent negative and positive pressure in cases in which good results have not or could not reasonably be expected to follow other

11. Laskey, N. F., and Silbert, Samuel: Thrombo-Angiitis Obliterans: Relief of Pain by Peripheral Nerve Section, Ann. Surg. **98:** 55-69 (July) 1933.

12. Denk, Wolfgang: Zur Behandlung der arteriellen Embolie, München. med. Wchnschr. **81:** 437-439 (March 23) 1934.

13. Allen, E. V., and MacLean, A. R.: Treatment of Sudden Arterial Occlusion with Papaverine Hydrochloride: Report of Case, Proc. Staff Meet., Mayo Clin. **10:** 216-220 (April 3) 1935.

14. Barker, N. W.; Brown, G. E., and Roth, Grace M.: Effect of Tissue Extracts on Muscle Pains of Ischemic Origin (Intermittent Claudication), Am. J. M. Sc. **189:** 36-44 (Jan.) 1935.

15. Samuels, S. S.: Gangrene Due to Thrombo-Angiitis Obliterans: Further Experiences with Treatment, J. A. M. A. **102:** 436-442 (Feb. 10) 1934.

16. Barker, N. W.: Results of Treatment of Thrombo-Angiitis Obliterans by Foreign Protein, J. A. M. A. **97:** 841-843 (Sept. 19) 1931.

17. Allen, E. V.: How Arteries Compensate for Occlusion: An Arteriographic Study of Collateral Circulation, Arch. Int. Med., to be published.

methods of treatment? Again no definite answer can be given and none is available in medical literature. Our own opinion is that good results ordinarily follow changing environmental pressure treatment in cases in which good results could be expected from other measures, and that when good results do not follow other measures, passive vascular exercise is usually valueless.

The results of treatment of thrombo-angiitis obliterans chiefly by intravenous injection of typhoid vaccine, as reported by Barker, are so excellent that one wonders whether the results of any other single type of treatment can be favorably compared with them. The important question arises: Were the cases of the same general type as those which we have presented in this paper and those which other authors have presented elsewhere? There can be no reliable answer, as the stages and degrees of vascular disease are widely variable. After data have been presented in as extensive a form as advisable, the final resort must be to opinion. Our opinion, based on observation of results of various types of treatment in a large number of cases of occlusive arterial disease, is that the alternate suction and pressure method has been some contribution to the program of treatment. To be sure, this treatment does certain things in peripheral vascular disease; it increases skin temperature and may relieve pain and induce healing of ulcers, but these results follow other methods as well. Evidence is still lacking that passive vascular exercise produces anything other than temporary increases in the circulation. The greatest benefit we have observed from this treatment is in the relief of the pain of ischemic neuritis.

The greatest therapeutic need is a satisfactory method of treating older patients who have occlusive arterial lesions as a result of arteriosclerosis. Such patients do not tolerate well repeated intravenous injections of typhoid vaccine, and the increased risk of sympathectomy, because of their age, ordinarily makes that procedure inadvisable. Moreover, the circulation tends to be diminished progressively, whereas in thrombo-angiitis obliterans remissions are not uncommon. It is for such patients that a new procedure is urgently needed. We cannot state as yet that passive vascular exercise is a significant advance in this direction. Objections may reasonably be offered to our results on the basis that patients did not have sufficiently long periods of treatment. We feel, however, that the periods reported are sufficiently long to allow some evaluation of the method.

Our opinion regarding passive vascular exercise is not necessarily final. A revision of this opinion, however, must follow recognition of greater benefit than is available at present. There is need for more specific information regarding the value of the method, and this may be expected as the passage of time allows more extensive observations.

SUMMARY AND CONCLUSIONS

The intermittent suction and pressure treatment of chronic occlusive arterial diseases increases the skin temperature temporarily, may relieve the pain of ischemic neuritis and trophic changes, and may induce healing of ulcers. It is not clear that these results are superior to those following other methods of treatment. However, it is our impression that the pain of ischemic neuritis is relieved to a greater degree than is ordinarily observed. As a result of our experiences we believe that passive vascular exercise constitutes some, but as yet poorly defined, contribution to the treatment of vascular disease.

DIURETIC ACTION OF INTRAVENOUS SODIUM DEHYDROCHOLATE

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Diuresis is obtained in therapeutics by the use of various substances acting through different mechanisms and belonging to different groups. According to their chemical structure and their pharmacologic action, diuretics may be classified as follows: water, the saline diuretics, the xanthines (caffeine, theobromine and theophylline), the digitalis group, mercurial diuretics and finally liver and bile acids.

In the healthy individual with normal water balance, water acts as a diuretic when it is ingested without sodium chloride. Therapeutically this finds use in the restriction of salt intake in the presence of edema, so that water and sodium chloride are eliminated.

The saline diuretics potassium and ammonium salts and urea induce diuresis probably through their osmotic effect. Ingested by mouth, they are most frequently used in conjunction with digitalis or to dilute the urine and decrease its acidity in genito-urinary irritations. Used in large quantities to produce marked diuresis, they cause gastro-intestinal irritation. Urea and the ammonium salts are contraindicated in nitrogen retention.

In the xanthine group, theobromine with sodium salicylate is preferred over caffeine or theophylline. Producing little or no effect on the central nervous system in contrast to caffeine, it is not as irritating to the gastro-intestinal tract as is theophylline. These diuretics are indicated in all cases of edema, whether of cardiac, hepatic or renal origin. After prolonged use a certain degree of tolerance is acquired, and in some instances there is discomfort and loss of appetite. They are of most value in nephritis, since these drugs apparently do not injure the kidney even when administered in large doses and for prolonged periods.

The diuresis produced by the digitalis group is due not to direct action on the kidney but indirectly to changes in the circulation. For this reason this group is particularly indicated in cardiac edema and ascites. Squill and digitalis are used together when large accumulations of fluid must be removed. Gastric disturbance and portal congestion interfere with absorption, lessening the efficiency of this group of diuretics. Used in conjunction with the salines or with the theobromine group excellent results are obtained, particularly when the patient is at home where facilities for the use of intravenous diuretics are not readily available.

The diuretic effect of calomel has long been recognized by clinicians,[1] being utilized especially by the combination of calomel with squill and digitalis in a very effective pill used in dropsy of cardiac origin. Parenteral administration of mercury for diuresis is available through the intravenous use of merbaphen and salyrgan. These preparations are particularly indicated in those cases in which absorption through the digestive tract is poor and in which rapid reduction of edema and ascites is desired. Keith, Barrier and

Read before the Section on Pharmacology and Therapeutics at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 14, 1935.

1. Cushny, A. R.: A Textbook of Pharmacology and Therapeutics, revised by C. W. Edmunds and J. A. Gunn, Philadelphia, Lea & Febiger, 1928.

Whelan [2] suggested that their effect may be increased by the oral administration of ammonium chloride. They are contraindicated in the presence of glomerulonephritis, malignant nephrosclerosis, uremia and preuremic states, active pulmonary tuberculosis and cachexia.

Since the introduction of liver and liver extract in the treatment of pernicious anemia, the diuretic effect of liver has been reported by numerous observers. In an experimental study of the action of bile, Landau and Held [3] noted that diuresis increased when bile was used in cases of renal edema. In their cases (eight of glomerulonephritis and nephrosis, three of cardiac origin) bile was administered orally in the form of cachets or capsules in the dosage of 1 grain (0.06 Gm.) four times daily. Very refractory cases frequently responded with complete disappearance of edema.

SODIUM DEHYDROCHOLATE

The diuretic action of sodium dehydrocholate (sodium decholin) was mentioned by Neubauer [4] in his original report on the relative nontoxicity of dehydrocholic acid. This bile salt and its acid are not present in either animal or human bile, being formed by oxidizing cholic acid. Comparing the sodium salts of desoxycholic, cholic and dehydrocholic acids, Neubauer found that sodium dehydrocholate had so little hemolytic effect as to be practically nonhemolytic. He found further that dehydrocholic acid was one twenty-fifth as toxic as desoxycholic acid in studies on the isolated frog's heart, and to be tolerated in large doses by the body as a whole, the maximum nonfatal dose being eleven times that of sodium taurocholate and almost a hundred times that of desoxycholic acid. In concluding that dehydrocholic acid and sodium dehydrocholate were strong, safe choleretics, Neubauer noted the diuretic effect of the sodium salt, commenting on its variability in appearance and its mildness. These preparations were introduced into therapeutics primarily as a cholagogue and choleretic in 1925 by Adlersberg and Neubauer.

The diuretic effect following intravenous administration of sodium dehydrocholate clinically has been reported by numerous observers.[5] During their study on blood pressure, blood cholesterol and diuresis following ingestion of bile acids, Adlersberg and Taubenhaus [5] observed an increased urinary output following intravenous injection of sodium dehydrocholate in eight of thirteen cases in their series. Normal individuals as well as patients with renal or cardiac lesions were present in both groups—those showing diuresis and those failing to show it. These authors concluded that diuresis cannot be predicted in any type of case and that there was no interrelationship between the effect of the drug on blood pressure, blood cholesterol and diuresis. In his studies Semler [5] found the most marked diuretic effect of this drug in patients with heart disease and a markedly congested liver. Rahmlow and Ritterband [5] and Lebermann [5] concurred with this observation, while Bix [5] made the additional observation that diuresis followed the use of sodium dehydrocholate intravenously in nephrosclerotic edema. Königer [5] found the drug to be especially effective as a diuretic in Laënnec's cirrhosis and also reported diuresis after its use in a case of inoperable mesenteric tumor which interfered mechanically with venous return. In one of her cases with marked ascites, sodium dehydrocholate failed to produce diuresis until after the abdomen had been tapped, whereupon a marked diuresis (from 3,600 to 6,000 cc. in twenty-four hours) ensued for six days following one injection of sodium dehydrocholate. Variability in the diuretic action of this drug has been noted by all observers.

Combined with Salyrgan.—Semler [5] reported that a brief diuresis from salyrgan could be lengthened by injection of sodium dehydrocholate on the following day. Injecting sodium dehydrocholate one day previously to administering salyrgan, Bix [6] was able markedly to increase diuresis from the latter. On the basis of these observations Bix was led to attempt administration of salyrgan and sodium dehydrocholate in the same syringe. Diuresis resulting from the injection of 10 cc. of 20 per cent sodium dehydrocholate and 1 cc. of salyrgan (4,500 cc.) was almost twice that from 2 cc. of salyrgan alone (2,500 cc.). Prohaska [5] likewise was able to increase diuresis from salyrgan by giving sodium dehydrocholate in the same syringe. Fleckseder,[7] by adding 20 cc. of 33 per cent dextrose to the salyrgan-sodium dehydrocholate mixture, induced daily outputs of 5,000, 6,000, 7,000 and, in one case, 13,500 cc. This combination was just as variable in its diuretic effect as decholin or salyrgan alone. In some of his cases Fleckseder was able to increase the output by the simultaneous oral administration of ammonium chloride.

MODE OF ACTION

Two possible explanations for the diuretic action of sodium dehydrocholate have been advanced. Rahmlow and Ritterband [5] believe that it may be due to renal irritation, basing their assumption on the observation that jaundice leads to inflammatory changes and that this derivative of a bile acid may act in a similar fashion. Cantarow and Stewart [8] have recently reported a toxic effect on the renal tubular epithelium resembling that of mercury and other tubular poisons in certain animals. Kauftheil and Neubauer [5] observed an increase in kidney volume lasting as long as the diuresis in the experimental animals being studied. Their oncometric studies revealed a similar enlargement in cases in which the administration of deep narcosis or posterior pituitary lobe extract prevented

2. Keith, N. M.; Barrier, C. W., and Whelan, Mary: Diuretic Action of Ammonium Chloride and Novasurol in Cases of Nephritis with Edema, J. A. M. A. **85**: 799 (Sept. 12) 1925.

3. Landau, A., and Held, J.: Sur l'action diuretique de la bile, Presse méd. **70**: 333 (March 14) 1925.

4. Neubauer, E.: Dehydrocholsaeure: Ein wirksames, praktisch ungiftiges Glied der Gallensaeuregruppe, Klin. Wchnschr. **2**: 1065 (June 4) 1925.

5. Articles on diuretic effect following intravenous administration of sodium dehydrocholate:
Adlersberg, D.: Zur Rolle der Leber im Wasserhaushalt, Wien. Arch. f. inn. Med. **25**: 269, 401, 1934.
Adlersberg, D., and Neubauer, E.: Ueber die Beeinflussung von Galle, Blut und Harn durch Zufuhr von Dehydrocholsaeure, Ztschr. f. d. ges. exper. Med. **48**: 291, 1926.
Adlersberg, D., and Taubenhaus, M.: Blutdruck, Blutcholesterin und Diurese nach Zufuhr von Gallensaeuren, Biochem. Ztschr. **177**: 400, 1926.
Bix, H.: Decholin als Diuretikum, Wien. klin. Wchnschr. **40**: 321 (March 10) 1927.
Kauftheil, L., and Neubauer, E.: Ueber Natrium Dehydrocholatdiurese, Arch. f. exper. Path. u. Pharmakol. **166**: 675-692, 1932.
Königer, D.: Decholin als Diuretikum, Therap. d. Gegenw. **32**: 540 (Oct.) 1930.
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Prohaska, A.: Decholin als Diuretikum, Therap. d. Gegenw. **32**: 382 (Aug.) 1930.
Rahmlow, H., and Ritterband, H.: Dehydrocholsaeure und Diurese, Deutsche med. Wchnschr. **52**: 1992 (Nov. 19) 1926.
Semler, R.: Zur diuretischen Wirkung der Gallensaeuren, Med. Klin. **23**: 891 (June 4) 1926.

6. Bix, H.: Beitrag zur Diuresetherapie, Wien. klin. Wchnschr. **41**: 1080 (July 26) 1928.

7. Fleckseder, R.: Steigerung der entwässernden Wirkungen des Salyrgans zu Höchleistungen, Wien. klin. Wchnschr. **43**: 136 (Jan. 30) 1930.

8. Cantarow, A., and Stewart, H. L.: Certain Effects of Sodium Dehydrocholate upon the Liver and Kidneys of Cats with Biliary Stasis, read before the Section on Medicine, College of Physicians, Philadelphia, March 25, 1935.

the appearance of diuresis after the injection of sodium dehydrocholate. They accordingly concluded that sodium dehydrocholate, despite its marked renal effect, is not the direct diuretic that it seems to be.

THE RÔLE OF THE LIVER

The majority of investigators of the diuretic action of this drug believe that its effect is due to its influence on the liver. Schwiegk,[9] in experimental studies on dogs, noted a marked increase in the blood supply of the hepatic artery following intravenous administration of sodium dehydrocholate, while the portal vein showed only a small increase. The mixed blood bathing the liver cells accordingly has a greater content of arterial blood and thus the supply of oxygen to the hepatic parenchyma is improved. Schwiegk feels that this arterial hyperemia of the liver is responsible for the influence of sodium dehydrocholate on various functions of the liver, including its influence on diuresis.

MECHANICAL INFLUENCE

The rôle of the liver in water metabolism has been thoroughly expounded by Adlersberg[10] and Villaret.[11] These authors are in agreement in assigning a mechanical rôle in regulating the water economy to the liver. The circulating blood forms but a fraction of the total mass of blood, the remainder being in a stage of relative stagnation as reserves in the different organs and capillary systems. The liver parenchyma is able to store about 1,300 cc. of liquid, according to Monneret.[12] Villaret found that injection of colored gelatin into the portal vein of a dog killed by exsanguination was followed in a short time by the appearance of the injected material in the center of the lobule, especially about the central vein. Injection under like conditions into the subhepatic vein results in the appearance of the colored mass in the periphery of the lobule. He states that this phenomenon, disappearing about six hours following death of the animal, is caused by contraction of living parenchyma and illustrates one phase of the mechanical influence of the liver on water metabolism.

In addition to this storage ability, the liver controls the return to the major circulation of all the blood of digestive origin. Mautner and Pick,[13] while considering the conception of a damlike or barrierlike action in the liver, suggest an autonomic sphincter system about the subhepatic veins. They hold that vagal irritation closes and sympathetic irritation opens this "subhepatic venous dam." The absorption and release of water, according to this conception, is influenced by alterations in the pressure of the hepatic veins. Contraction of the veins increases pressure in the capillaries; water is pressed into the lymph spaces and eventually reaches the thoracic duct. By means of this "overflow pipe" mechanism the liver can supervise the inflow and outflow of water within the blood and tissue circulation. Villaret showed, in dogs, that the introduction of a great mass of water (from two to three times that of the blood) directly into the general circulation was blocked by the energetic action of this barrier.

Adlersberg has studied this mechanism through comparison of the effects of chronic histamine and chronic phosphorus poisoning experimentally produced in dogs. Led to this procedure by noting the disturbance in water metabolism in certain liver disorders, phosphorus was chosen, since by regulating its dosage hepatic injury can be achieved without cardiac, capillary or renal damage. In the early stages of the poisoning, Adlersberg found increased diuresis following administration of water in contrast to decreased diuresis in the later stages. This resemblance between the changes in chronic histamine and chronic phosphorus poisoning and their analogy with similar changes in certain involvements of the hepatic parenchyma led him to conclude that the same mechanism operates throughout. In the early stages the increased output is possibly connected with the subhepatic venous barrier; under the assumption that this is open, the water would more rapidly flow through the liver. In the later stages, with liver damage, one may assume closure of this barrier mechanism and consequent interference with the flow of water. Villaret likewise emphasizes a vagosympathetic control of the subhepatic venous dam. This has a twofold purpose: (1) an automatic protection for the right side of the heart against irregularities in delivery of return circulation after abnormal increase of the circulatory mass and (2) a protective barrier against heterogeneous proteins.

HORMONIC INFLUENCE

Villaret mentions also the difference between excretion of water injected into the general circulation and that ingested by mouth. Rowntree[14] refers to the observation that the administration of distilled water intravenously is not at once followed by diuresis but that polyuria usually appears in a few hours after the ingestion of water by mouth in excess of from 10 to 15 cc. for each kilogram. In attempting to explain the difference in diuresis following water given parenterally and orally, Cow[15] has suggested that in the latter case an enzyme from the alimentary tract comes into play. Glaubach and Molitor,[16] in studying the diuretic action of bile extracts, assign this suggested hormonic rôle of water regulation on the part of the alimentary tract to the liver. Adlersberg in his exposition of the rôle of the liver in water metabolism stresses this "hormonic" action. In his experiments he found that only when parenterally administered water is infused into a mesenteric vein is its diuretic effect equal to that of swallowed water. He subscribes to the hypothesis that this action may be due to a hormone mixing with the water as it passes through the liver, so affecting it that when it reaches the kidney it is more rapidly excreted.

The explanation of the diuretic effect of sodium dehydrocholate advanced by Adlersberg is based on the belief that it induces a hyperemia of the liver cells, as shown by Schwiegk,[9] thereby causing more water to be brought under the mechanical and hormonic supervision of the liver. No explanation has been advanced as to why the diuretic effect of this substance is manifested in man only on its use in patients with cardiac decompensation.

The increased diuresis resulting after simultaneous intravenous injection of sodium dehydrocholate and salyrgan in certain cases has been closely studied by Fleckseder.[17] At first he advanced the belief that this

9. Schwiegk, H.: The Importance of the Blood Supply of the Liver to Liver Therapy, Naunyn-Schmiedeberg, Arch. f. exper. Path. u. Pharmakol. **168**: 693 (1932).
10. Adlersberg, D.: Leber und Wasserhaushalt, Klin. Wchnschr. **13**: 393 (March 17) 1934.
11. Villaret, M.: L'intervention physiologique et pathologique du foie dans la diurèse, Presse méd. **42**: 1529 (Oct. 3) 1934.
12. Monneret, cited by Villaret.[11]
13. Mautner and Pick, cited by Adlersberg and by Villaret.[11]
14. Rowntree, L. G.: Water Balance of the Body, Physiol. Rev. **2**: 116-169 (Jan.) 1922.
15. Cow, D.: Diuresis, J. Physiol. **48**: 1, 1914, cited by Rowntree.[14]
16. Glaubach, S., and Molitor, H.: Untersuchungen über die hormonal diureseregelnde Taetigkeit der Leber, Arch. f. exper. Path. u. Pharmakol. **132**: 31-49, 1928.
17. Fleckseder, R.: Ueber Anwendungs und Wirkungsweise der komplex Quecksilberdiuretika, Ztschr. f. Urol. **28**: 32-35, 1934.

effect may be due to the possible action of sodium dehydrocholate preventing the separation of mercury in the hepatic parenchyma and its subsequent excretion in the bile so that it is returned to the general circulation. More recently he has advanced the belief that there is a special compound formed when sodium dehydrocholate and salyrgan are administered in the same syringe and that this is responsible for the increased diuresis following such administration.

UNTOWARD EFFECTS

Neubauer [4] and others [5] have reported the nontoxicity of sodium dehydrocholate. Sterner, Bartle and Lyon [18] observed a temporary hypotension in 50 per cent of their cases, no appreciable change in pulse rate and the occurrence in many cases of a bitter taste a few seconds after the injection was begun. They "believe sodium dehydrocholate can be considered a nontoxic bile salt that can be administered intravenously with reasonable safety." Their views are concurred in by Ziegler,[19] who compared sodium dehydrocholate with other bile salts and concluded that "sodium dehydrocholate is the least toxic of the bile salts and is practically nonhemolytic, being at least 120 times less hemolytic than sodium taurocholate and glycocholate." Rahmlow and Ritterband [5] in their studies on the diuretic effect of sodium dehydrocholate in man observed no ill effects in the urine after doses as high as 2 Gm. three times a day. All the cases in the series here presented showed more or less albuminuria, which was either uninfluenced or noticeably decreased during treatment.

Sodium dehydrocholate intravenously is contraindicated in mechanical obstruction of the bile passages, acute hepatitis and acute yellow atrophy.

REPORT OF CASES [20]

CASE 1.—A white woman, aged 46, had hypertensive cardiovascular disease, mitral insufficiency with hepatic congestion and edema of the legs. The urine showed a faint trace of albumin, while other laboratory examinations were within normal limits. The daily urinary output was from 500 to 600 cc. before treatment was instituted. Intravenous administration of 10 cc. of 20 per cent sodium dehydrocholate (1 ampule) on three successive days failed to increase the urinary output or reduce the edema. This decreased markedly after the use of Southey's tubes but gradually returned again, the patient leaving the hospital unimproved before further treatment could be instituted.

CASE 2.—A white woman, aged 46, had rheumatic heart disease and cardiac decompensation with edema of the ankles. The urine showed a very faint trace of albumin, and other laboratory observations were within normal limits. The daily urinary output varied from 500 to 1,000 cc. Three daily intravenous injections of sodium dehydrocholate resulted in no appreciable difference in the urinary output and the patient left the hospital, unimproved, before further treatment could be instituted.

CASE 3.—A white woman, aged 60, complained chiefly of abdominal enlargement on admission. Two months before she had been operated on at another hospital, when a diagnosis of Laënnec's cirrhosis was made and omentopexy performed. A faint trace of albumin was found in the urine, no other outstanding laboratory changes being noted. Administration of 10 cc. of 20 per cent sodium dehydrocholate intravenously had no influence on the average daily output of 850 cc. Injection of 0.5 cc. of salyrgan with 10 cc. of 20 per cent sodium dehydrocholate caused an output of 1,850 cc. on the day of injection and 2,500 cc. on the following day. Repetition of this procedure, after the output had fallen to its former level, resulted in a diuresis of 3,500 cc. Two subsequent injections of one ampule of sodium dehydrocholate (10 cc. of 20 per cent solution) and 1 cc. of salyrgan produced no notable increase in diuresis. When discharged, the patient was slightly improved and had lost 5 pounds (2.2 Kg.).

CASE 4.—A white man, aged 45, had decompensated rheumatic pancarditis, mitral stenosis, edema and ascites. The heart was uniformly enlarged, with a rough presystolic and systolic murmur over the mitral area; the abdomen showed shifting dulness, the liver border being 5 cm. below the costal margin; there was pitting edema of the sacrum and lower extremities. Laboratory examinations, other than a trace to a very faint trace of albumin in the urine, were not remarkable. The average daily output of urine was from 400 to 600 cc. Three successive daily injections of 10 cc. of 20 per cent sodium dehydrocholate caused no increase in output. Injection of 0.25 cc. of salyrgan produced an output of 1,175 cc.; injection of 0.5 cc. of salyrgan with 10 cc. of 20 per cent sodium dehydrocholate resulted in a diuresis of 5,250 cc., while injection of 0.25 cc. of salyrgan with the same amount of sodium dehydrocholate produced an output of 4,050 cc. on one occasion and 1,750 cc. on another.

On discharge this patient had lost 39 pounds (17.7 Kg.) and was markedly improved.

CASE 5.—A white woman, aged 54, had arteriosclerotic heart disease with edema and ascites, and diabetes mellitus. The heart was slightly enlarged to the left, the abdomen showed shifting dulness, the liver edge was 6 cm. below the costal margin, and pitting edema of both arms and legs was present. While the patient was in the hospital the urine improved from a trace to a faint trace of albumin. Other laboratory observations, with the exception of the hyperglycemia, were not significant. The daily urinary output while the patient was on digitalis and ammonium chloride averaged 600 cc. Three successive injections of 10 cc. of 20 per cent sodium dehydrocholate produced a maximum diuresis of 1,100 cc. On the day following the third injection of sodium dehydrocholate, one injection of 1 cc. of salyrgan was followed by an output of 4,200 cc. Subsequent injections of 1 cc. of salyrgan and 10 cc. of sodium dehydrocholate (20 per cent) resulted in increased diuresis, the maximum result being 2,700 cc. Edema and ascites disappeared; the patient lost 25 pounds (11.3 Kg.) and was markedly improved on discharge.

CASE 6.—A man, aged 46, had myocardial degeneration with edema and ascites, hypertension, and acute infectious arthritis. The urine at times showed a very faint trace of albumin; other laboratory observations were not remarkable. The daily urinary output varied from 225 to 800 cc. Intravenous administration of 0.5 cc. of merbaphen was followed by a diuresis during the ensuing five days of 7,570 cc., the highest daily output being 2,350 cc. on the fourth day after injection. The output fell to 250 cc. and subsequent injection, on three successive days, of 10 cc. of 20 per cent sodium dehydrocholate resulted in an output of 11,615 cc. for five days, the highest daily output of 3,250 cc., which occurred on the fifth day, two days after the third injection of the drug. In this case the output of 11,615 cc. following the use of the relatively nontoxic sodium dehydrocholate compares favorably with that of 7,570 cc. after the use of merbaphen. On discharge this patient was markedly improved and had lost 41 pounds (18.6 Kg.).

CASE 7.—A white man, aged 46, had chronic glomerulonephritis, myocarditis with edema and ascites. The heart was moderately enlarged; a definite fluid wave was determined in the abdomen (the liver margin was not felt) and there was marked edema of the lower extremities. Other than a lessening of albuminuria from a dark cloud to a cloud and a phenolsulfonphthalein output of 40 per cent, laboratory observations were not significant. The daily urinary output of 450 cc. was raised to 1,225 by administration of digitalis and ammonium chloride. Intravenous injection of 10 cc. of 20 per cent sodium dehydrocholate resulted in the output of 2,300 and 1,800 cc., on the first and second days following injection. A second injection of this drug resulted in an output for two days of 1,675 and 2,475 cc. Later injections of sodium dehydrocholate resulted in increased output, the greatest being 3,275 cc.

18. Sterner, R. F.; Bartle, H. J., and Lyon, B. B. V.: The Cholagogue Effect of the Intravenous Injection of Sodium Dehydrocholate, with a Résumé of Literature on Bile Salt Metabolism, Am. J. M. Sc. **182**: 822 (Dec.) 1931.

19. Ziegler, E. E.: Sodium Dehydrocholate—Its Specific Effect on Pneumococci, J. Lab. & Clin. Med. **16**: 868 (June) 1931.

20. These cases were seen in the ward service of Dr. Edward L. Bortz at Lankenau Hospital.

On discharge this patient was markedly improved, the edema had subsided and he had lost 27 pounds (12 Kg.).

CASE 8.—A Negro man, aged 47, had syphilitic myocarditis, decompensation with edema and ascites. Noteworthy on physical examination was the presence of pitting edema of the legs, with involvement of the penis and scrotum; the abdomen was distended, with a fluid wave and shifting dulness, the liver being enlarged to the umbilicus. The heart sounds were of poor quality. The Wassermann and Kahn reactions were four plus, the urine showed variable amounts of albumin and other examinations were not unusual. The daily urinary output averaged 500 cc. Injection of 10 cc. of 20 per cent sodium dehydrocholate raised this to 1,100 cc.; repetition of this dose with 0.5 cc. of salyrgan gave a maximum output of 2,650 cc. on the day following injection, the daily average being above 1,500 cc. for the ensuing five days. At the end of this time the edema and ascites were gone and the patient had lost 26½ pounds (12 Kg.).

TABLE 1.—*Maximum Output and Weight Before and After Treatment and Total Number of Injections*

Case	Diagnosis	Maximum Output Before (in Cc.)	Maximum Output After	Weight Before (Lbs.)	Weight After	Total Number of Injections
1.	Cardiovascular disease, hypertension, mitral insufficiency with edema	600	600	134¾	136	3D
2.	Decompensated rheumatic heart disease, edema and ascites	1,000	1,050	117¼	117	3D
3.	Laënnec's cirrhosis.....	850	3,500 DS½*	133	128	1D; DS1; 2DS½
4.	Decompensated rheumatic pancarditis, mitral stenosis, edema and ascites	600	5,250 DS½	207	168	3D; 1S¼; 3DS¼; 2DS½
5.	Arteriosclerotic heart disease, edema and ascites; diabetes mellitus	600	4,200 S1	140	115	3D; 1S1; 5DS1
6.	Myocardial degeneration with edema and ascites, hypertension, acute infectious arthritis	800	3,250 D	225	184	3D; 1N½
7.	Chronic glomerulonephritis; myocarditis with edema and ascites	825	3,275	159	132	6D
8.	Decompensated syphilitic myocarditis with edema and ascites	1,150	2,650 DS½	168	141½	1D; 1DS½
9.	Decompensated arteriosclerotic heart disease with edema and ascites	500	7,200 DS1	151	134	2D; 1S1; 1DS¼; 2DS1
10.	Decompensated rheumatic myocarditis with edema and ascites; mitral stenosis	1,100	7,275 DS½	260	162	11D; 1S1; 1S2; 1DS¼; 5DS½; 4DS1
11.	Decompensated rheumatic pancarditis with edema	900	2,955 S2	154½	119	3D; 4S½ 3S1; 4S2; 2DS2
12.	Hypertensive arteriosclerotic cardiovascular disease with edema and ascites	500	2,575	182	157	3DS½

D = 10 cc. of 20% sodium dehydrocholate; N½ = 0.5 cc. of merbaphen; S¼, ½, 1 = 0.25, 0.5, cc. of salygran.
* Dosage causing maximum output.

CASE 9.—A white woman, aged 67, had decompensated arteriosclerotic heart disease with edema and ascites. Positive physical changes were slight cardiac enlargement, a palpable liver border, fluid wave in the abdomen, and pitting edema of the lower extremities. Albumin was present in the urine, varying from a trace on admission to a very faint trace on discharge, other laboratory observations being not remarkable. Ten cubic centimeters of 20 per cent sodium dehydrocholate and 1 cc. of salyrgan administered simultaneously resulted in an output of 7,200 and 2,150 cc. on the two days following administration. Injection of sodium dehydrocholate alone, on two separate occasions, resulted in an output of 1,750 cc. and 1,235 cc. respectively, compared with the daily average output of from 300 to 500 cc. before treatment was instituted. The edema having subsided, subsequent injections of sodium dehydrocholate and salyrgan in combination, and of salyrgan alone, produced no diuresis. On discharge the patient had lost 17 pounds (7.7 Kg.), had no edema and was markedly improved.

CASE 10.—A white man, aged 61, had decompensated rheumatic myocarditis, mitral stenosis, edema and ascites. On physical examination there was marked cardiac enlargement, a mitral systolic murmur, marked enlargement of the liver, shifting dulness with fluid in the abdomen, and marked edema of the lower extremities. The daily urinary output averaged from 350 to 500 cc. There was a variable albuminuria (faint to a very faint trace) throughout treatment, and other laboratory observations were not remarkable. Numerous injections of sodium dehydrocholate and salyrgan, alone and in various combinations, were given. Of the eleven injections of sodium dehydrocholate alone (10 cc. of 20 per cent solution) five injections produced no increased diuresis. The highest output from this drug occurring one day after the injection was 2,925 cc. The greatest output from salyrgan alone followed injection of 2 cc., a total output of 7,700 cc. (2,125 and 5,575) ensuing on the two following days. The greatest diuresis of the entire series of this patient's injections, 7,275 cc. on the day of injection and 3,175 cc. on the following day, a total of 10,450, followed injection of 0.5 cc. of salyrgan and 10 cc. of 20 per cent sodium dehydrocholate. The patient's weight was reduced 98 pounds (44.5 Kg.), the ascites was eliminated and the edema was markedly reduced. The inevitable tendency to recurrence of the edema necessitates effective diuresis every six or seven days.

CASE 11.—A white woman, aged 35, had decompensated rheumatic pancarditis with edema, auricular fibrillation and asthma. The patient entered the hospital in collapse. The heart and liver were both markedly enlarged, numerous asthmatic and moist râles were heard throughout the chest and the lower extremities were markedly edematous. Albuminuria improved from a cloud to a very faint trace during her stay in the hospital; other laboratory observations were not remarkable. The daily urinary output averaged 500 cc. Three daily injections of 10 cc. of 20 per cent sodium dehydrocholate produced a maximum output of 1,050 cc.; 0.5 cc. of salyrgan administered on two successive days resulted in an output of 1,025 and 1,775 cc.; 2 cc. of salyrgan at one time produced an output of 1,030 and 1,135 cc.; on another occasion the same amount caused an output of 1,000 and 2,955. Injection of 10 cc. of 20 per cent sodium dehydrocholate and 2 cc. of salyrgan together was followed by an output of 1,500 and 1,900 cc. on one occasion and on another by output of 1,225 and 2,190 cc. Weight had decreased 35½ pounds (16 Kg.), the edema had disappeared and the patient was markedly improved on her discharge.

CASE 12.—A white man, aged 60, had hypertensive arteriosclerotic cardiovascular disease with edema and ascites. There was a moderately enlarged heart, fluid wave and shifting dulness in the abdomen, and marked edema of the lower extremities. Urinalysis showed a faint to a very faint trace of albumin during treatment, while other laboratory observations were not remarkable. The daily output was 500 cc. Injection of 10 cc. of 20 per cent sodium dehydrocholate and 0.5 cc. of salyrgan resulted in an output of 2,575, 1,875 and 1,230 cc. on three successive days, the output falling to 500 cc. thereafter. A second injection of the same dosage of both drugs was followed by an output of 2,475 cc. two days after the injection; a third injection resulted in an output of 1,525 and 2,500 cc. on the following days. The patient lost 25 pounds (11.3 Kg.), edema and ascites disappeared, and on discharge from the hospital he was markedly improved.

SUMMARY

Cases 1 to 4 showed no increase in diuresis following intravenous administration of sodium dehydrocholate alone. Cases 3, 4 and 5 responded variously to subsequent administration of different amounts of salyrgan in combination with 10 cc. of 20 per cent sodium dehydrocholate, the markedly increased diuresis obtained in case 4 suggesting that the dose of salyrgan can be markedly reduced by this combination.

Marked diuresis followed intravenous injection of sodium dehydrocholate in cases 6 and 7.

Fair diuresis followed the use of sodium dehydrocholate in cases 8 to 11 inclusive. Combination of

varying amounts of salyrgan with 10 cc. of 20 per cent sodium dehydrocholate resulted in marked diuresis in cases 8 to 12, results in cases 9, 10 and 12 again suggesting that the dose of salyrgan can be markedly decreased by combination with sodium dehydrocholate.

Table 1 summarizes salient data on the twelve cases here presented. Typical variability in response to sodium dehydrocholate and salyrgan, alone and in combination, is shown in table 2.

COMMENT

With the exception of one case (Laënnec's cirrhosis) all cases in this series presented edema or edema and ascites accompanying myocardial disease and hepatic congestion. It is for this type of case that the diuretic action of sodium dehydrocholate has been especially suggested.

In four of the eleven cases in which sodiom dehydrocholate alone was used, no increased diuresis was observed (cases 1 to 4). Cases 5 to 11 inclusive showed an increased diuresis after sodium dehydrocholate intravenously, cases 6 and 7 being particularly marked. Results in eight cases (3, 4, 5, 8, 9, 10, 11 and 12) showed the most effective diuresis after simultaneous injection of varying amounts of salyrgan with 10 cc. of 20 per cent sodium dehydrocholate. In six of these cases (3, 4, 8, 9, 10 and 12) the maximum output followed administration of 1 cc. or less of salyrgan in combination with sodium of dehydrocholate, a result comparing very favorably with that reported by Fleckseder,[17] Bix [5] and others, when 1 cc. or more of salyrgan was used in this combination.

TABLE 2.—*Variability in Diuretic Response*

Case		First 24 Hours, Cc.	Second 24 Hours, Cc.	Total 48 Hours, Cc.
4	0.25 cc. S	1,175	650	1,825
	10 cc. D	650	575	1,225
	0.25 cc. S, 10 cc. D	1,750	1,125	2,875
	0.25 cc. S, 10 cc. D	4,050	1,050	5,100
	0.5 cc. S, 10 cc. D	4,550	700	5,250
10	10 cc. D	900	1,550	2,450
	10 cc. D	2,925	1,500	4,425
	10 cc. D	825	625	1,550
	1 cc. S	1,875	5,775	7,650
	2 cc. S	2,125	5,575	7,700
	0.5 cc. S, 10 cc. D	7,275	3,175	10,450
	1 cc. S, 10 cc. D	1,300	5,775	7,075

S = salyrgan, D = sodium dehydrocholate.

In the three cases in which ammonium chloride was used, no marked increase in diuresis was observed. It was impossible to predict just how any given case would respond to any of the doses and combinations used, the variability in diureses following intravenous injection of sodium dehydrocholate observed by Adlersberg and Taubenhaus,[5] Königer [5] and others being confirmed by our observations.

CONCLUSIONS

1. A series of twelve patients were given 10 cc. of sodium dehydrocholate intravenously, alone and in combination with salyrgan, in order to determine the resultant diuretic effect.

2. Three patients showing no diuretic effect from the bile salt and five more showing moderate diuresis from its action all experienced marked diuresis when given this bile salt combined with salyrgan.

3. Four other patients were not given this combination but the bile salt alone. Two of them showed a good response and two failed to respond at all.

4. This small series suggests that, while sodium dehydrocholate has some diuretic effect, it becomes a satisfactory diuretic in most cases only when combined with salyrgan. The effective dosage of the mercurial diuretic salyrgan seemed to be considerably lower when used in this combination.

Sixteenth and Jefferson streets.

ABSTRACT OF DISCUSSION

DR. B. B. VINCENT LYON, Philadelphia: After six years of experimental work with sodium dehydrocholate in Germany and France, and after the bibliography of published papers had exceeded 100, it was introduced into America. In 1929 Wakefield, Powelson and McVicar of the Mayo Clinic studied and reported favorably on its choleretic action. In 1931 Sterner, Bartle and I studied and reported favorably on its cholegogic action. In 1932 Jenkelson and Altman used it to enhance the value of cholecystography. In 1934 Swalm, Bartle, Sterner and I published a report of a two year clinical study of its therapeutic effectiveness in sixty cases of various diseases and disorders of the liver and concluded that its exhibition alone or preferably combined with other measures might be considered helpful. Since then I have used it extensively in the tablet form (dehydrocholic acid) and to lesser extent by vein (sodium dehydrocholate) in a large number of disorders of the liver, and I feel that it has helped the patients beyond question, although the extent of its benefits is somewhat variable. Its effectiveness is increased when given by vein and I no longer have fear of using 10 cc. of the 20 per cent solution. I have had no experience with it in the dropsy of cardiovascular-renal diseases, except when the liver has been enlarged by chronic passive congestion or when there was associated hepatic ascites. Although not invariably successful it has usually helped me, and I have as yet seen no harmful results from its use. Cantarow and Stewart have recently noted a toxic effect on the kidneys of certain experimental animals following the use of this drug. Last spring Shay, Fitzhugh and Ravdin, before the Philadelphia College of Physicians, gave a preliminary report on their favorable impressions from its use in biliary migraine and several forms of so-called allergic diseases. I am satisfied that it has helped the majority of my cases classified as biliary migraine, but I have had no personal experience with it in allergic diseases. In our clinical study of sixty cases of disorders of the liver in which the drug was given chiefly by mouth in tablet form, we were able to note a diuretic effect of slight degree in only five cases. On the other hand, there was a marked increase in the amount of bile flow from the liver to the intestine, which helped to combat constipation and in some cases produced a definite bile irritation diarrhea. When one is confronted with a single drug that seems to act favorably in such a wide variety of diseases and disorders, one necessarily becomes cautiously skeptical. Nevertheless, I feel that this particular bile salt acid is a useful and safe drug.

DR. ABRAHAM CANTAROW, Philadelphia: In our studies of the biliary tract of cats, Stewart and I have observed the effects of the intravenous injection of sodium dehydrocholate. Observations were made on thirty cats with ligation of the common duct and on twenty normal adult cats. From one to sixteen daily injections were given, the amount administered being 0.2 cc. of a 20 per cent solution. The animals were killed by bleeding under light ether anesthesia twenty-four hours after the last injection. Striking changes were noted in the renal tubular epithelium in every case, being as marked in the normal animals as in those with biliary stasis. The cells of both convoluted and Henle's tubules showed all stages of epithelial degeneration and necrosis from simple hydropic swelling to complete denudation of the basement membrane. Active regeneration occurred rapidly, with the production of an atypical, flattened type of epithelium described by MacNider, Oliver and others, in animals receiving various nephrotoxic substances. This type of epithelial change was present to some degree after a single injection but was most conspicuous after from two to six injections. As the number of injections increased, the lining cells of the tubules increased in height, becoming cuboidal and later columnar in type. The impression was obtained that the atypical, flattened cells, regarded by most observers as highly resistant to subsequent injury, gradually developed into the

cuboidal and columnar cells. These, too, were apparently more resistant to injury than the normal cells. Mitotic figures were seen at all stages, being particularly numerous after from three to seven injections. Similar changes were noted in animals in which a single injection was made into the portal vein. Nonprotein nitrogen values as high as 148 mg. per hundred cubic centimeters of blood were obtained after a single injection, the highest figure obtained subsequently being 67 mg. per hundred cubic centimeters. On the basis of these observations it appears that sodium dehydrocholate is highly nephrotoxic for the cat. Other species may differ, but the characteristic localization of the lesion suggests that it may bear some causal relation to the diuretic action of this substance. The fact that diuresis occurs almost exclusively in patients with liver functional impairment may be dependent on diversion of the excretion of this substance from the liver to the kidneys under such circumstances.

DR. FRANKLIN A. WEIGAND, Philadelphia: It is rather odd that Kauftheil and Neubauer did not complete the observation made when they noted gross changes in the kidney, by studying it microscopically. However, Rahmlow and Ritterband have studied the effect of sodium dehydrocholate on the kidney and have found no ill effects in the urine after using as much as 2 Gm. of the drug three times a day. In my cases, either those that presented albuminuria showed no increase in albuminuria or it was definitely decreased during the course of treatment.

THE INTRADERMAL REACTION FOR CHANCROIDS WITH CHANCROIDAL BUBO PUS

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In 1913 Ito, working with Carl Bruck at Neisser's clinic, devised a specific intradermal test for chancroid —Ducrey bacillus infection. The diagnostic value of this test was later confirmed by Reenstierna, working with a serum containing antibodies of the Ducrey bacillus. Today this test is spoken of as the Ito-Reenstierna reaction.

Ito, for his cultures, used 24 hours old streptobacillus colonies from two Besançon blood agar tubes. The bacilli are suspended in physiologic solution of sodium chloride with the addition of 0.5 per cent phenol and heated at 60 C. for two hours. Reenstierna employed unheated material in the presence of phenol for fourteen days in the icebox. Frei [1] in his survey of the entire subject up to 1927 says that he employed the water of condensation. He also states that it makes little difference what method of preparation is employed.

The antigen is employed as an intradermal test, readings being made in forty-eight hours, the same as in the tuberculin reaction. The reaction will generally show positivity within from eight to twelve days after the infection,[2] being dependent on the virulence of the organism, on the length of the infection and on the course of the disease. In a recent study Lippert [3] states his belief that uncomplicated chancroidal infections will give a negative reaction unless there is extensive destruction. With beginning bubo the test may be negative. If ulcers are old, even with no bubo, the test may be positive, and with extensive broken down bubo it is practically always positive. The reaction is more likely to be positive after the lymph nodes are involved. The reaction is specific with less than 1 per cent nonspecific reactions [4] and persists at least for twenty-five to forty years, even fifty years in a case of Reenstierna.[1] In the recent symposium of the French Dermatologic Society on chancroid, held at Strasbourg, there was a surprising unanimity of opinion as to the specificity of the test. In European clinics an antigen, dmelcos vaccine, elaborated according to the method of Nicolle and Durand, is quite generally employed. This preparation is a mixture of the killed streptobacillus in suspension and of an antibody containing serum elaborated according to the technic of Reenstierna. It is used not only for diagnostic purposes but also for therapy, either intramuscularly or intravenously in rapidly ascending doses. Generally a few doses suffice to check the disease.

In the United States it is impossible to procure this agent because of certain public health regulations. Moreover, despite numerous attempts to prepare our own antigen, it has been found most difficult to grow the streptobacillus of Ducrey. Thus the need for a simple diagnostic test for this disease is obvious.

As long ago as 1923 Boidin and Turpin [5] distinguished between what they spoke of as "septic" and "aseptic" pus—i. e., sterilized and nonsterilized pus—and mentioned their use in veterinary medicine. They felt that it had some resemblance to protein therapy. Fáy and Gaál [6] treated a series of cases of chancroid by simply withdrawing 1 cc. of pus from a chancroidal bubo and injecting it, without sterilization, subcutaneously into the buttock. It was termed "pyotherapie." Injections were given every four to five days. Later they employed doses of 0.25 cc. up to 1 cc., increasing 0.25 cc. at a time. There was no infection and the results were very good. Cruveilhier,[7] also in 1922, after subcutaneous injections of autogenous pus (heated at 57 C. for one-half hour) had noted good and rapid effects on soft chancre infection, and in 1926 Vigne, Fournier and Acquaviva [8] used boiled milk injections for treating chancroidal bubo and also "pyotherapie." They employed 1 cc. of pus plus 20 cc. of saline solution put up in 1 cc. capsules and sterilized at 56 C. for one hour. They injected the material in ascending doses, 0.25, 0.5, 0.75 up to 1 cc., intramuscularly every two to three days. Thirty cases were treated. It was noted that after the first injection pain disappeared. The edema of the lymph node went down and hospitalization was shortened. In two cases there was no response. Frei was not sure whether this was a vaccine treatment or a special form of protein therapy. He suggested that this might be settled by using chancroidal pus for intracutaneous tests as in lymphogranuloma inguinale. Annuzzi [9] compared tests made with this specific bubonic pus with the Nicolle and Durand vaccine and found the results to be comparable, though perhaps weaker and more transitory after intradermal injections of sterilized pus. Nicolas, Lebeuf and Weigert [10] confirmed the comparable character of the two antigens, and Bizzo-

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zero, in discussion, said that in one case inoculated with this specific sterilized pus a bulla formed, the serum from which, inoculated in the same patient, caused the appearance of a characteristic papular intracutaneous reaction. Nicolas and Lacassagne [11] went still further and took a group of patients and infected them with the bacillus of Ducrey. They then did a series of intradermal tests with the chancroidal sterilized pus, making tests every two days. In eight cases they found positive tests after from six to eight days. Bratzlavsky and Marenius [12] tested out ninety-nine cases, using the pus antigen according to the technic described by Frei. There were thirty-three cases of uncomplicated chancroid and nine with buboes. There were five cases with histories of previous soft chancres and fifty-two other control cases but with no history of chancroids. In 81 per cent of the chancroidal cases there were positive reactions. Among the fifty-two controls the reactions were negative except in two cases presenting indefinite histories and primary syphilis. Franchi [13] employed the sterilized serum aspirated from the surface of soft chancres as an intradermal antigen. It likewise gave specific reactions. Jersild [14] has also studied the problem and confirmed the fact that, whether sterilized or unsterilized pus from a chancroidal bubo was used as an intradermal antigen, it would give positive reactions in chancroidal cases.

INVESTIGATIONS

Stimulated by these facts and because of the great need of further diagnostic help in certain moot cases of Ducrey bacillus infection, it was decided to investigate this problem further. Also, we were aware of the frequent suspected cases in which it was impossible to find the bacillus of Ducrey either in the original ulcers or in the auto-inoculations so much employed in the European clinics [15] because of greater ease in finding the Ducrey organisms in the fresh secondary lesions.

PREPARATION OF ANTIGEN AND DESCRIPTION OF TEST

The antigen for the intracutaneous chancroidal test is prepared from a proved chancroidal bubo; i. e., one in which the bacillus of Ducrey can be demonstrated either in the primary lesion or in the pus present in the bubo. The patient from whom the material is obtained must have a negative Frei reaction and the antigen prepared must react negatively in patients with proved lymphogranuloma inguinale.

The pus aspirated from a suppurating unruptured node is diluted with five parts of physiologic solution of sodium chloride and then heated at 60 cc. for two hours and repeated for one hour the following day. The material is then tested for sterility.

The test itself is simple to perform and is similar to the tuberculin or Frei test. One-tenth cubic centimeter of antigen is inoculated intracutaneously and the results are read in forty-eight hours as negative to four plus, depending on the degree and severity of the reaction. A positive test presents itself as an infiltrated, rounded papule with a base from 0.5 to 1 cc. in diameter. When the reaction is marked, the induration is much larger and may even go on to necrosis.

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NUMBER OF TESTS PERFORMED AND RESULTS

From Nov. 10, 1934, to March 19, 1935, 433 intracutaneous chancroidal tests were performed on different subjects, all patients in the Cleveland City Hospital. In fifty-two cases the test was found to be definitely positive and in 272 negative. The remaining 109 were repeat tests, either negative or positive. The fifty-two positive cases can be conveniently divided into four groups:

Group A: Patients studied during the active manifestations of the disease.

Group B: Patients with old known previous chancroidal infection.

Group C: Patients with histories of previous venereal ulcerations and suppurating buboes.

Group D: Patients without active infection or history of such in the past.

Group A is composed of twenty-two patients, twenty-one male and one female. In fourteen of these the bacillus of Ducrey was demonstrated in the primary lesions. The remaining eight cases were diagnosed by the typical chancroidal ulceration and at times bubo formation plus a positive intracutaneous test.

Group B consists of five patients in whom a previous hospital record showed the clinical diagnosis substantiated by the presence of the bacillus of Ducrey. The test was found positive three years after the infection in two of these patients and six months after the infection in the remaining three.

In group C there are twenty patients in whom the test was positive without any active manifestation of the disease. All were males and had a history either of previous genital ulceration or of previous suppurating bubo. The lapse of time between infection and positive reaction in seven of these twenty cases was from three to nine years. Nine patients gave a history of infection for from ten to twenty-four years and four a duration of from thirty to thirty-four years. It is interesting to observe that in this entire group of twenty patients fifteen, or 75 per cent, had a recent or old syphilis. In addition seven, or 35 per cent, had a positive Frei test. Of these seven, one was an active case of lymphogranuloma inguinale and the other six either had a history of bubo in the past or inguinal scars were noted.

Group D consists of five patients. These will be considered under possible "false positive tests."

CONTROL CASES

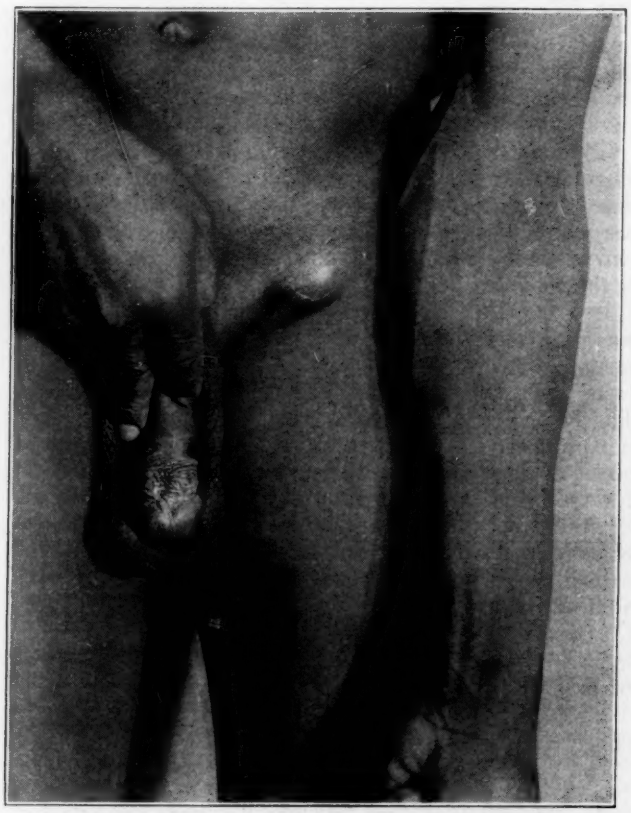
In relation to other venereal diseases the test was found negative in ten cases of lymphogranuloma inguinale, twenty-two primary syphilitic lesions, twenty-seven active secondary syphilitic cases, thirty-seven presenting latent or central nervous system syphilis, nine cases of acute gonorrhea and two presenting granuloma inguinale. In the remaining negative tests there were fifty cases of pulmonary tuberculosis, twenty-six in all stages of pregnancy, thirty-five presenting various skin diseases, including mycotic infections, and a miscellaneous group of fifty-four, chiefly from the medical wards.

DURATION OF ULCERATION AND BUBO IN RELATION TO TEST

In patients in whom the test was negative on entry and gradually became positive, the increased positivity could readily be followed by repeated weekly tests. Nine patients in group A showed a negative intracutaneous test on admission and subsequently became positive. The interval from the onset of the primary lesion to the first positive test varied from five to nine weeks, with an average of seven weeks.

Of these nine patients, four had involvement of the inguinal nodes. The interval from the onset of the bubo to the first positive test varied from four to five weeks. In the remaining thirteen patients of group A the test was positive on admission. The duration of the latent period from the development of positivity could not, of course, be observed. The primary lesion had been present (based entirely on the history of the patient and not on hospital observation) from one to seven weeks, with an average of four weeks. In nine of these the lymph node involvement had been present from two to five weeks, with an average of three weeks.

Considering, then, the entire group of twenty-two patients (one female, twenty-one male) the average latent period from the presence of the primary ulcer to the first positive test was five weeks and from the appearance of the bubo three weeks.



Chancroidal ulcer of Frenulum. Bubo and positive intradermal tests on forearm with three different antigens.

In two patients, one male and one female, with proved active chancroidal infection without bubo formation, the test remained negative six weeks and seven weeks, respectively, after the lesion appeared. Further follow-up tests could not be obtained. Since in two cases of group A with active chancroidal infection the test did not become positive until after eight and nine weeks, these two patients giving negative tests can be considered only as not being followed sufficiently long.

RELATION OF TEST TO BACILLUS OF DUCREY, ULCER AND BUBO

At first glance there seemed to be no close relationship between the degree of the reaction in the intradermal test and (1) the presence or absence of the bacillus of Ducrey and (2) the extent and type of primary lesion.

Thus in the eight patients in whom the bacillus of Ducrey could not be demonstrated in the ulcers after careful search, the skin reaction in seven was strongly positive and in the remaining case only weakly so. In the fourteen patients with positive smears the test was strongly positive in eight and only moderately or weakly positive in six. While this is not a large series, it would, however, tend to show only moderate relationship between the abundance of organisms and the degree of positivity of the test.

It would seem that the greater the tissue involvement the stronger the reaction to the test. An analysis of the material failed to bring this out. In eight patients in whom the skin involvement was minimal, i. e., one or two lesions with a total area of about 1 sq. cm. or less, the reaction was mild in three, moderate in two and strong in three. In seven cases in which the skin involvement was between 1 and 2 sq. cm. the reaction was mild in three, moderate in three and strong in one. In the remaining six patients in whom the skin involvement was extensive the test was noted as mild in three, moderate in two and strong in only one. In the only female in this group suffering from an adenitis but with no primary lesion, the test was strongly positive.

It might be stated here that patients in groups B and C, in whom the reaction was positive without active disease, with only a past history, similarly gave varying degrees of positivity to the test. Eleven were noted as strongly positive, while the remaining fourteen were only moderately so.

As to the effect of bubo formation on the skin allergy, it was found that in thirteen patients of group A with buboes the test was strongly positive in twelve and only weakly positive in one. Bubo formation tends to induce a strong allergy. Of the remaining nine patients without lymph node involvement, three gave a strong reaction and six reacted only moderately.

Three patients had negative intracutaneous tests on the day on which pus was aspirated, but the pus made an active antigen. All three subsequently, from eight to ten days later, gave a positive skin test. Another patient, while yielding pus with strongly antigenic properties, reacted weakly to other potent antigens. Autoinoculation in one with a weakly positive test did not appear to raise the allergic reaction to the test.

In using normal patients as controls, no instance has been observed in which the specific allergy of the skin has been raised by the intracutaneous test, despite the fact that repeated tests have been made on the same patients.

POSSIBLE FALSE POSITIVE TESTS

There were five patients in group D, three males and two females, who gave a positive intradermal test yet had no active lesions and gave no history of previous venereal ulceration or of suppurating bubo. Of the females, one had a history of gonorrhea nine years before and the other had a positive blood Wassermann reaction. One of the men had an active lymphogranuloma inguinale, one a positive blood Wassermann reaction, and the other a history of gonorrheal urethritis in the past. The diagnosis is given in each case to emphasize the fact that venereal disease was common to this group, and a chancroidal infection in the past would not be unusual for these patients, even though denied by the history. Consequently we are inclined to accept the intradermal reaction as evidence of old submerged chancroidal infection.

COMPARISON OF DMELCOS AND PUS ANTIGEN

In the last few weeks of this investigation a small amount of dmelcos vaccine was obtained.[16] A number

16. We are indebted to Dr. Marion B. Sulzberger of New York for the supply of dmelcos vaccine.

of tests were done simultaneously with the other tests, the diluted chancroidal pus being used. In no instance was there any discrepancy noted; i. e., a positive dmelcos vaccine always gave a positive test with the chancroidal antigen; similarly, a negative chancroidal antigen test gave a negative dmelcos test. It was noted, however, that the dmelcos antigen gave a more clear-cut and stronger reaction.

COMMENT

This study seems to confirm the observations of previous workers as to the specificity of an antigen prepared from the pus of chancroidal buboes and used as an intradermal diagnostic test. This test, like the Frei test, is probably to be attributed to the presence in the pus of the causative factor of the disease; perhaps specific antibodies in the pus may also play a rôle. At any rate, the reaction to dmelcos vaccine would point to these two probabilities. The test, in our experience, is quite specific and in the hands of careful workers, with plenty of material, will undoubtedly be of great value in diagnosing certain suspected chancroidal infections in which organisms cannot be found. Apparently the allergic powers in the human body caused by a chancroidal infection, once they are developed, persist to a certain extent throughout life. Naturally, in performing the test, antigen prepared from a certain patient's chancroidal bubo should not be used for diagnostic purposes on that patient.

SUMMARY

1. The use of an intradermal diagnostic test, with sterilized pus from chancroidal buboes, confirms the specificity of the test in cases of Ducrey bacillus infection and corroborates the observations of earlier workers.

2. The interval from the presence of the ulceration to the production of a positive test was on the average five weeks.

3. The presence of a chancroidal bubo seems to increase the rapidity and the intensity of the intracutaneous test.

4. The allergic properties raised in a patient by a chancroidal infection persist for years, in our experience at least from thirty to thirty-four years.

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ABSTRACT OF DISCUSSION

DR. EUGENE F. TRAUB, New York: In the past the dermatologist had but few laboratory tests to help him to differentiate between the skin lesions of two or more diseases that might often closely approximate one another. Cutaneous tests are now commonly employed in tuberculosis, dermatophytosis, inguinal lymphogranuloma and chancroids. Because of the larger number of persons who have at some time been infected with tuberculosis or tinea, the skin tests in these diseases must be carefully weighed before they are given any diagnostic significance. In the case of inguinal lymphogranuloma the Frei test is specific and diagnostic. Drs. Cole and Levin have now reported definite confirmation of the observations of previous workers as to the specificity of the intradermal test for chancroids, using chancroidal bubo pus as an antigen. The use of this method raises several pertinent points in view of the fact that the dmelcos antigen has been found uniformly satisfactory; however, it cannot be obtained legally in the United States. The only reason for searching for another test is the difficulty in obtaining the dmelcos vaccine and the difficulty in growing the Ducrey bacillus. I should like to ask the authors why we have this difficulty in growing the organism, because recently at an academy meeting some men believed that the organism could be grown rather easily and others maintained that it could not. Human pus was originally used in the Frei test. It was impossible in this way to get a preparation that could be standardized. This was all rectified when Levaditi, Pavant and Schoen in 1932 showed that the brains of mice could be infected, and this opened a source of antigen, Grace and Suskind, of a measured and graded amount of uniform potency and quality. Such a supply is unlimited. Does it not seem logical, therefore, that in the chancroidal test we shall eventually strive to get away from the use of human pus? In the meantime, the test under consideration offers a valuable temporary aid. Both tests, the dmelcos and the present one, parallel each other in the period of time at which the tests become positive, the length of time the patient reacts positively, from 25 to 40 years, and so on. But the dmelcos vaccine gives a sharper and more clean-cut reaction. It is interesting that only a moderate relationship existed between the abundance of organisms and the degree of positivity of the test. In the work in which I engaged with trichophytin, the culturing of an organism from the skin or nails was not even necessarily accompanied by a positive skin test. When extensive or acute "ids" were present, the majority of the cases gave generally moderately strong positive reactions, but the strong allergy produced by bubo formation was not so evident in cases of dermatophytosis with "ids."

DR. DAVID BLOOM, New York: Until now this method of identifying Ducrey infection was not used much in this country by others or myself at the Dermatology Department of Dr. Fox. The reason was that we were concerned particularly in distinguishing between buboes due to lymphogranuloma infection virus and ulcus molle buboes. We were concerned in convincing others and also ourselves of the existence of inguinal lymphogranuloma buboes. In this we could succeed only by using the Frei antigen, which consists of sterilized pus from those gland tumors which looked clinically like inguinal lymphogranuloma, or a test substance which represents with certainty Ducrey infection, and this is the dmelcos vaccine, a suspension of streptobacilli. This dmelcos vaccine is not manufactured here and for some reason is not permitted to be brought into this country. In the near future, however, this vaccine will be manufactured here and we shall not have to embarrass our Canadian friends by asking them to supply us with the vaccine. Now that we are convinced of the existence of inguinal lymphogranuloma buboes and are able in the great majority of cases to make the diagnosis clinically, the method of testing reported by Drs. Cole and Levin will be of great additional value, of lower value, however, than the streptobacillus vaccine itself. In the same way will the Frei antigen, as prepared until now, lose in value, should we succeed in the future in isolating the lymphogranuloma infection virus itself.

DR. JAMES L. PIPKIN, San Antonio, Texas: During the last five years I have done 1,200 Frei tests, obtaining about sixty positive reactions. I felt that there was an overlapping in these adenitis cases which were giving positive reactions with the prepared antigen. After some difficulty I was able to obtain some dmelcos vaccine from Dr. Williamson in Canada. I rechecked a number of the positively reacting patients who had given conflicting readings. I want to speak for the specificity of dmelcos vaccine and the sterile chancroidal pus. I was able to get positive reactions in the questionable cases by using the chancroidal-test materials, and negative readings in known cases of lymphopathia venerea. It was apparently very specific in the limited number of cases tested. It also is a very valuable help in diagnosing large extragenital chancroidal lesions in which the organism cannot be demonstrated.

DR. HAROLD N. COLE, Cleveland: In a way we should make an excuse for a report on a study of this sort using material such as sterilized pus when there is a vaccine on the market, but it is impossible, because of our laws, to get it in this country. It may be that some can grow the Ducrey bacillus with ease; unfortunately, that is not our experience in Cleveland. It is a most difficult procedure. We have been trying it for quite a few years. Of course, with the dmelcos vaccine one has a standardized test as against a more or less crude test in which the pus is used. Nevertheless, one gets excellent results using this sterilized chancroidal pus as a test and as a therapeutic procedure. In several cases of resistant chancroidal infection the therapeutic results from the use of this material injected subcutaneously were striking. Moreover, there is a place for a test of this sort, because one encounters certain

cases in which it is exceedingly difficult to differentiate between chancroidal infection and inguinal lymphogranuloma infection. They do not always run true to form and, too, one may even get a case in which there is a double infection and, naturally, if under this condition it can be proved with specific measures instituted, the patient will respond much more rapidly. Therefore I feel that, until there is a dmelcos vaccine in this country, there is a place for the employment of a chancroidal pus vaccine of this type. What this material consists of it is difficult to say. It undoubtedly consists of a certain number of killed, macerated organisms in the pus and it probably also contains a certain amount of antibodies that have been produced by the body against this infection.

ETHER-OIL RECTAL ANALGESIA IN OBSTETRICS

MODIFIED TECHNIC

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AND
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INDIANAPOLIS

The experimental work on which the clinical use of ether-oil rectal anesthesia is based was conducted in 1913 in the Pharmacological Laboratory of what was then the New York University and Bellevue Hospital Medical College, by Prof. George B. Wallace,[1] and in the Chemical Laboratory of the College of the City of New York, by the late Prof. Charles Baskerville.[2]

Twenty-four experiments on dogs were made by Wallace to determine its practicability. Typical tracings of heart and lungs of a dog under ether-oil anesthesia showed the respiration and carotid blood pressure to be evenly and fully sustained. Baskerville proved by experiments that the rate of evaporation of ether from all oils kept at body temperature in a water bath was constant, despite the changing ratio of ether.

The clinical application of these observations was reported in 1913 at the seventeenth International Medical Congress, in London.[3] Clinical experience proves that ether evaporates in the human body when given with oil by rectum at the rate of about 1¼ drachms (4.5 cc.) every five minutes and that it is impossible for it to leave the oil in any other ratio. In clinical experiments made in 1913 it was noted that 2½ ounces (75 cc.) of ether by rectum never produced sleep in the average adult but that analgesia quite often resulted.

The application of these experimental and clinical observations in obstetric practice was made ten years later, in 1923, at the Lying-In Hospital in New York, under the supervision of Dr. Asa B. Davis, chief of staff of the hospital.[4] At that time more than 300 confinements occurred in this hospital each month.

The agreement between Davis and Gwathmey governing the principles to be observed in developing the method was (1) to employ only drugs in common use; (2) to devise a method requiring neither specialized technic nor unusually equipped or trained personnel, and so simple that it could be used in the home or the hospital by any physician; (3) to modify or stop the administration if either the mother or the child appeared to be in danger at any time; (4) to publish the results, whether favorable or not.

After many drugs and various combinations were used[4a] a standard formula and technic were evolved. The technic, as developed at the Lying-In Hospital, has been used in more than 15,000 cases in that hospital alone, and the method is now used in all civilized countries. A comparison of the records of three different house surgeons at the Lying-In Hospital for the month of March of three successive years (1927-1929) shows that the method has been standardized. Ninety per cent of all cases were successful with this method. Davis said before the New York Obstetrical Society in 1924, after observing the method in many cases, that he had yet to know of a case wherein either mother or child was in any way injured by this method.[4b] In 1925 Davis[4a] stated that the "ether practically never stops the contractions of the uterus when given at the time directed. In the second stage, the patient bears down in the usual way. Even if the drugs should prolong or stop labor, no harm is done and at any rate the patient does not suffer."

The work of Meltzer[5] and Hooper[6] in the laboratory, and clinical experience[7] have proved the synergistic action of magnesium sulfate, with both ether and morphine.[8] However, in obstetrics unpleasant results sometimes follow the hypodermic injection of magnesium sulfate. This is sufficient reason for omitting the magnesium sulfate and substituting a drug that is effective in expert hands and harmless in the inexperienced. Tuberculosis, heart and kidney diseases, and threatened eclampsia do not contraindicate the administration of ether by rectum. By substituting pentobarbital sodium by mouth for magnesium sulfate by hypodermic injection, the possibility of an occasional abscess is avoided. The technic as presented here is simplified, and made safer.

DRUGS USED IN MODIFIED TECHNIC

Pentobarbital Sodium.[9]—Bernard Fantus[10] states that "the fatal dose of the barbiturates is from fifteen to thirty times the therapeutic dose." Gillespie,[11] reviewing all the literature regarding the barbiturates since 1904, says: "No clear-cut case has yet been reported where a barbiturate in therapeutic dosage has produced death in the absence of complicating factors." Recovery is reported in several instances after more than 15 Gm. (225 grains of barbital) and after 5 Gm. (75 grains of phenobarbital). Recovery is reported[12] of a patient having taken 11 Gm. (172 grains) of sodium

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Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 14, 1935.

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10. Fantus, Bernard: The Therapy of the Cook County Hospital: Barbiturate Poisoning, J. A. M. A. **103:** 749-750 (Sept. 8) 1934.

11. Gillespie, R. D.: On the Alleged Dangers of the Barbiturates, Lancet **1:** 337-345 (Feb. 17) 1934.

12. Gwathmey, J. T.: The Barbiturates a Safe Preliminary Medication for Surgical Operations, J. A. M. A. **103:** 1536-1537 (Nov. 17) 1934.

ipral, the salt of ethylisopropylbarbituric acid. A thorough examination by her physician, one year after this occurrence, showed no pathologic changes, and, to all outward appearances, she is in perfect health. Pentobarbital sodium acts more quickly, is less productive of delirium, and affords a deeper amnesia and a less protracted hypnosis than any other barbiturate tried by us.[13] The accompanying table illustrates the relatively low toxicity of pentobarbital sodium.[9]

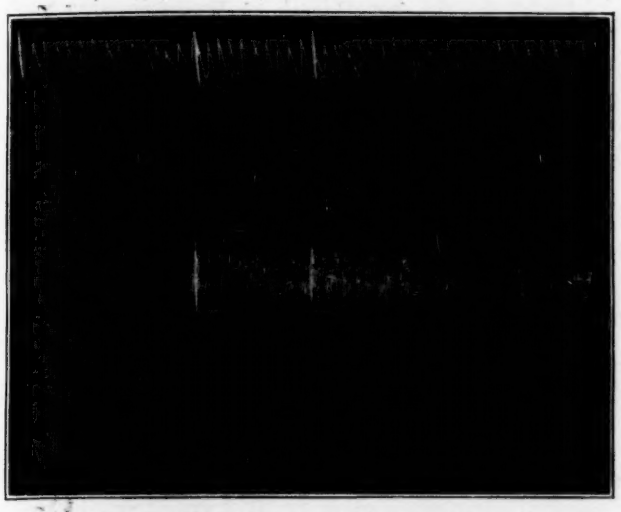

Fig. 1.—Tracings from dog under oil-ether anesthesia. The records from above downward are: (1) respiration; (2) carotid blood pressure; (3) base line at zero, and (4) time in half seconds. The anesthesia was begun at 11: 30.

Paraldehyde.—Sollmann [14] states: "The sleep is normal and, with ordinary doses, without after-effects. Its acute toxicity is low, so that 100 Gm. produced only very prolonged sleep." Bastedo [15] says: "Ordinarily paraldehyde is a very safe hypnotic, its tendency being to stimulate the heart and respiratory tract." By mistake, a nurse added 2 ounces (60 cc.) of paraldehyde instead of 2 drachms (8 cc.) to the usual oil-ether-surgical mixture, which prolonged the sleep, but the recovery was uneventful, without treatment of any kind. Another nurse added 4 ounces (120 cc.) instead of 4 drachms (15 cc.) of paraldehyde to the usual ether-oil surgical mixture. The patient to whom this was administered slept from Saturday morning until Monday morning. Artificial respiration, transfusion, and the like resulted in an uneventful recovery. Two drachms is the amount used in the present obstetric mixture. This amount has been given thousands of times with the ether-oil mixture in surgery, with only favorable results. Paraldehyde adds nothing to the analgesia but makes the whole technic smoother and safer.

Relative Toxicity of Drugs

	Minimum Effective Dose	Minimum Fatal Dose	Ratio
Pentobarbital sodium	40	110	2.7
Barbital	225	310	1.37
Amytal	72	180	2.5

Ether.—Ether is the most nearly universal anesthetic. The nausea and vomiting that usually follow inhalation anesthesia without preliminary medication are practically eliminated by giving the ether by rectum and using a barbiturate as a preliminary. In suitable dosage and with proper technic, ether rectally may be a sedative, an analgesic, or an anesthetic. Equal parts of ether and olive oil of each 2 drachms (8 cc.) placed in the rectum will act as a sedative in whooping cough and effectively prevent a coughing spasm in young children. In larger dosage, up to 2½ ounces (75 cc.), with half the amount of oil, by rectum, it acts as an analgesic only. With increased volume, but in the same proportion (4 to 6 ounces [120 to 180 cc.] of ether), it acts by rectum as a powerful anesthetic. It is promptly excreted by the lungs of both the mother and the new-born infant. Tuberculosis is no contraindication to ether given by rectum. As it boils at 96 F., it passes in and out of the fetus without any cumulative effect.

Ether given by rectum affects the sensory nerves to a far greater extent than when given by inhalation. Frequently patients under ether-oil analgesia may be conversed with while being operated on. The fact that the upper portion of the brain is but little affected is most important in obstetrics. The patient, even when seemingly unconscious, will "bear down" when told to do so. The 2½ ounces of ether by rectum will never produce surgical anesthesia. It is therefore unnecessary for the obstetrician to be present when this is given. This amount may be considered standard for the average adult (130 to 170 pounds [59 to 77 Kg.]), but may be increased to 3 or decreased to 2 ounces for those overweight or underweight. The experienced obstetrician will individualize, with both the ether and the pentobarbital sodium.

Quinine.—Quinine [16] stimulates and continues the contractions of the uterus when labor pains start. In the dosage used, it is ineffective in initiating or producing premature labor. It will intensify weak labor pains. It is more persistent than solution of posterior pituitary and safer, since it never produces uterine spasm. In the isolated virgin guinea-pig uterus, Lieb [17] found that a 1 : 100,000 solution brought an immediate increase in the rate and strength of the contractions. At the Lying-In Hospital, when quinine was omitted from

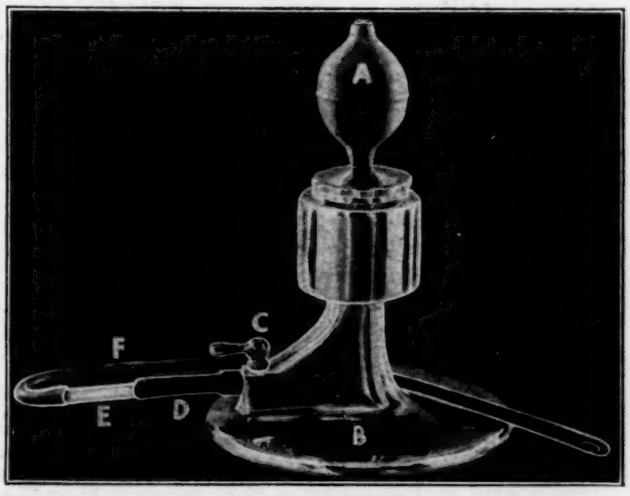

Fig. 2.—Apparatus for McCormick rectal analgesia.

13. McCormick, C. O.: Popularizing Ether-Oil Rectal Analgesia in Obstetrics, J. Indiana State M. A. **25**: 454-456 (Oct.) 1932; Anesth. & Analg. **11**: 166-173, 1932.
14. Sollmann, Torald: A Manual of Pharmacology and Its Applications to Therapeutics and Toxicology, ed. 4, Philadelphia, W. B. Saunders Company, 1932, especially p. 780.
15. Bastedo, W. A.: Materia Medica, Pharmacology, Therapeutics, Prescription Writing, for Students and Practitioners, ed. 3, Philadelphia, W. B. Saunders Company, 1932, especially p. 433.
16. Sollmann, Torald: A Manual of Pharmacology and Its Applications to Therapeutics and Toxicology, especially p. 590.
17. Lieb, C. C.: Pharmacologic Action of Ecbolic Drugs, Am. J. Obst. **69**: 1-32, 1914 (especially p. 21, on quinine).

the solution labor was delayed and uncertain in several hundreds of cases; with its reintroduction, labor was progressive and uneventful. Qualitative tests for quinine excreted in the urine in 100 cases gave ninety-two positive and eight negative results. An erythema develops once in about 500 cases and may be disregarded. The fatal dose is 8 Gm. (128 grains), but

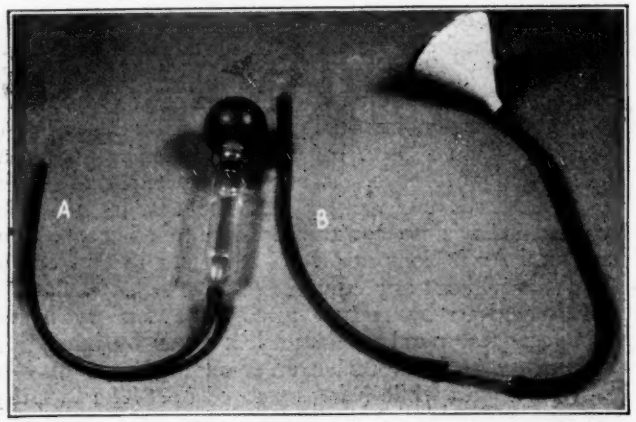

Fig. 3.—*A*, asepto-syringe equipped with a 22 French catheter. *B*, 5 ounce funnel equipped for gravity instillation.

recovery has followed a dose of 30 Gm. (480 grains). The amount used at one time with this method is 1.25 Gm. (20 grains). Clinical experience proves that it is practically harmless in the dosage used, but if omitted labor is delayed.

TECHNIC WITH NEW MODIFICATIONS

Changes in the obstetric technic have been made by McCormick [13] and his associates in the obstetric department of Indiana University School of Medicine. Briefly, these modifications involve the following:

1. The omission of magnesium sulfate by hypodermic injection, and the substitution of pentobarbital sodium (nembutal) by mouth. For the nurse, this is easier to give; for the patient, it is safer and easier to take.

2. The substitution of the degree of the patient's suffering for the amount of cervical dilatation as a time criterion for the administration of the sedatives and the rectal instillations. Experience has demonstrated that the distress of the patient is a more practical guide than cervical dilatation.

3. The explanation, to the patient, of the steps to be taken for her convenience and safety.

4. The instillation of the rectal mixture with the McCormick apparatus (fig. 2), which is completed readily within thirty seconds, falling within any pain interval, instead of with the funnel method, requiring from ten to fifteen minutes. No assistant is required, and the instillation is higher and better retained.[18]

5. The substitution of a 5 to 10 per cent (a heaping tablespoonful in 1 quart of water) solution of sodium bicarbonate enema for the usual soapsuds enema. If the pentobarbital sodium is not given within eight hours after the initial enema, the enema is repeated. It should not be given just before the rectal instillation. If this is unavoidable, any remaining water is siphoned back before the rectal instillation.

As with all other forms of analgesia and anesthesia, experience gives added success.

18. The McCormick apparatus is not essential. With an assistant the funnel method or an asepto syringe equipped with a catheter has proved quite practical (fig. 3).

ETHER-OIL MIXTURE

The formula for the rectal mixture, as now used, is ether, 2½ ounces (75 cc.), quinine alkaloid 20 grains (1.3 Gm.), alcohol 45 minims (3 cc.), paraldehyde 2 drachms (8 cc.) and liquid petrolatum or olive oil enough to make 4 ounces (120 cc.).

These agents are mixed in the following order: (1) quinine and alcohol, (2) paraldehyde, (3) ether, (4) oil. The mixture is then stirred, strained through cotton, bottled and corked.

PRELIMINARY PROCEDURE

The patient, having had a cleansing enema and a bath, and having been placed in bed, is addressed by the obstetrician as follows: "We are desirous of making your labor as painless as possible. Therefore, when your pains become uncomfortably severe, let the nurse know and she will give you a couple of capsules [19] to relieve you. When the pains again become uncomfortable notify her as before and she will give you another capsule [19] and perhaps a hypodermic.[20] Later when this medicine begins to lose its effect, she will inject a solution into your rectum." [21]

The following routine is then employed: Instead of the first two intramuscular injections of magnesium sulfate the patient is given orally 3 grains and 1½ grains (0.2 and 0.1 Gm.) respectively of pentobarbital sodium. One-sixth or one-fourth grain of morphine is usually given hypodermically with the second instead of with the first dose of pentobarbital if the patient is a primipara and labor is active. On the other hand, if the labor is not uncomfortably active, or if it is of the prolonged type, the second dose of pentobarbital may be repeated once or oftener before the morphine is given (not more than 10 to 12 grains [0.6 to 0.7 Gm.] in twenty-four hours). When the effects of the morphine begin to wear off, the ether-oil-quinine solution is administered by rectum and repeated as often as required, except that the quinine is omitted after the second instillation. Usually one instillation suffices. Morphine is omitted if delivery is anticipated within four hours and is rarely

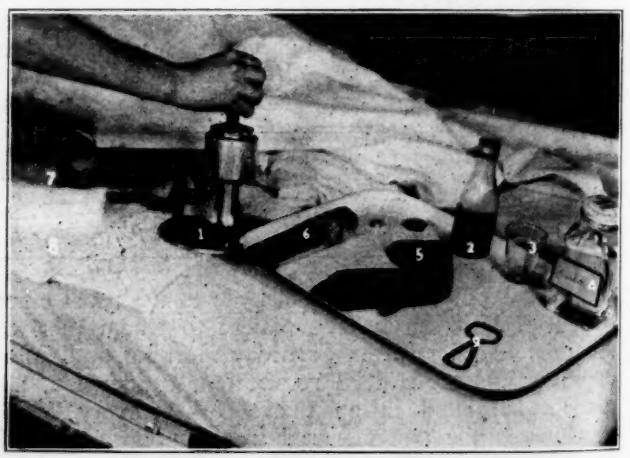

Fig. 4.—Analgesia tray, and patient in postion for instillation.

necessary if the patient is a multipara. If delivery is anticipated within four hours, the oral administration of pentobarbital and the rectal ether-oil instillation are promptly given, simultaneously. After the pentobarbital is given, the patient should be kept quiet. She is

19. Pentobarbital sodium, 1½ grains (0.1 Gm.), repeated if necessary.
20. Generally speaking, if the patient is a primipara and delivery is not expected within twenty-four hours, one-sixth or one-fourth grain (0.01 or 0.016 Gm.) of morphine is given.
21. Ether-oil-quinine. McCormick.[13]

given only the necessary attention. The environment should be such as to favor her falling asleep. If she is in a ward, the bed is screened; if in a room, the shades are lowered and the light is excluded; the door is closed. The patient must be watched while asleep, as she may turn from side to side during contractions and fall out of bed.

RECTAL INSTILLATION

The patient is placed on her left side, with the buttocks at the side of the bed. Seaweed or tragacanth lubricating jelly (not petrolatum) is liberally applied about the anus. A well lubricated 22 F. catheter is inserted from 6 to 8 inches into the rectum. It is important that the catheter pass the presenting part. It is held in place with the left hand. With the right hand the bulb is compressed at the conclusion of a pain not more than twenty or thirty times a minute (fig. 4). The mixture may be poured in a funnel (fig. 2 *B*). During the administration of ether mixture the patient is told to breathe deeply, with her mouth open, and to draw up with the anal sphincter, as if she were trying to avoid expelling gas; this will induce reverse peristalsis and permit the fluid to run in more rapidly. After all the ether mixture is passed out of the catheter, the catheter is clamped to prevent air being drawn into the return. The catheter is then gently withdrawn. Pressure is made with a towel over the anus during three or four contractions after the catheter is withdawn. The patient may now be on her back or whatever position is most comfortable. The quiet appearance of the patient should not be misleading; she may be having strong contractions and should be watched carefully. The rectal instillation may be given at intervals of two and one-half hours if necessary. At actual delivery, ethylene, nitrous oxide or ether is given by inhalation, but not chloroform. When the baby is born, if a gas-oxygen apparatus is used, all anesthetic is cut off, and 5 per cent carbon dioxide and oxygen, under pressure, is given before the cord is cut.

SUMMARY

After ten years' experience with the original and other methods and many modifications, the advantages of this modified method and the reasons for its popularity are summed up by numerous authorities and listed by one of us (McCormick) as follows: [22]

1. It is the safest of all satisfactory analgesias used to date. Several series of many thousands of cases have been reported, no maternal or infant mortality being attributed to its use. The largest of the series is a group of 20,000 cases, reported in 1930.[4d]

2. There are no major physical contraindications. It may be given with impunity to patients presenting cardiac disease, tuberculosis, pneumonia, acute bronchitis, nephritis, eclampsia, placenta praevia, and pelvic disproportion. In the event of a pathologic condition of the rectum, it is no more irritating than the soapsuds enema formerly used. It is used with equal facility in the home and in the hospital.

3. It serves as a satisfactory analgesic in 85 to 95 per cent of cases. Most failures are due to faulty technic.

4. It requires but little equipment and experience and is readily administered by the general practitioner.

5. It can be started early in the first stage and administered any time during labor.

6. The patient is much more cooperative than in "twilight sleep" or sodium amytal analgesia.

7. In addition to analgesia, it affords a most gratifying amnesia, the patient rarely having more than a vague recollection of the labor.

8. The physician does not have to be in constant attendance, the average instillation being effective for from two to six hours.

9. It is not likely to prolong labor and not infrequently the second stage is shortened.

10. The baby suffers no ill effects.

11. It incurs no complications of labor or postpartum pathologic condition.

12. Forceps deliveries are decreased in number, and lacerations are no more frequent than with other methods of delivery.

13. Mental and physical shock are lessened. Normal appetite is restored within a few hours following delivery.

14. It is relatively inexpensive, especially compared with nitrous oxide and ethylene gas. At wholesale cost the ingredients of the ether-oil mixture total only a few cents.

15. It dovetails excellently with gas and inhalation ether as adjuvants during the perineal stage and instrumentation, only 50 per cent or less of the usual amount of ether being necessary. Chloroform should never be used in conjunction with the method.

17. In performing a cesarean section under local anesthesia, it affords an excellent preliminary.

18. This form of analgesia is available to practically every woman in labor.

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22. McCormick, C. O.: Rectal Ether Analgesia in Labor, Am. Med. **39**: 155-160 (April) 1933.

VINYL ETHER OBSTETRIC ANESTHESIA FOR GENERAL PRACTICE

WESLEY BOURNE, M.D., F.R.C.P. (CANADA)
MONTREAL

Although the usefulness of vinyl ether in obstetrics has already been described, [1] this drug may be dealt with again on account of the continuation of its employment at the Royal Victoria Montreal Maternity Hospital, from which increased confidence has been gained concerning its relative safety. It is therefore proposed to recount some of its effects, particularly those on the liver, to add new information of its action on this organ and to point out that vinyl ether seems to be especially suitable for obstetric anesthesia in general practice.

The original report of the use of vinyl ether in obstetrics gave an account of its administration to 152 parturient women and a detailed analysis of the first fifty cases. The condition of the patients as well as the procedure of delivery varied considerably. Several of the women were "toxic" and the deliveries varied from spontaneity to high forceps and low cesarean section. The vinyl ether was administered either by dropping it on a small "open" mask or with oxygen in a closed system having a carbon dioxide absorption attachment (Foregger). The latter method is much more desirable, as it not only precludes asphyxia and waste of material but affords a means of mixing vinyl ether vapor with any of the anesthetic gases. Whenever it seemed advisable, a preliminary period of intermittent evanes-

From the Royal Victoria Montreal Maternity Hospital.
Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Eighty-Sixth Annual Session of the American Medical Association, Atlantic City, N. J., June 14, 1935.

1. Bourne, Wesley: Lancet **1**: 566 (March 17) 1934.

cent anesthesia (it is almost impossible to produce analgesia with vinyl ether) was produced for each earlier severe labor pain.

Among the first fifty patients, the bromsulfalein dye test [2] for liver function was carried out on four, including a very "toxic" woman of the renal type. A striking comparison was afforded by these liver function tests, and those after chloroform administered under similar conditions. The data showed that after vinyl ether very little dye was retained in the blood; that is, there was practically no liver damage, while the administration of chloroform was followed by marked dye retention, indicating definite liver impairment. Leake, Knoefel and Guedel [3] have reported no gross pathologic changes in the liver, heart, lungs, kidneys and other tissues of dogs; Goldschmidt, Ravdin, Lucke, Muller, Johnston and Ruigh [4] found liver necrosis in dogs only after vinyl ether had been given for three hours, and none in monkeys. Although fully appreciating the value of these observations, Raginsky and I [5] thought it worth while to study more thoroughly the actions of vinyl ether on the liver. Accordingly, it was administered to normal dogs, to dogs with chloroform-damaged livers, and to partially starved dogs, and the liver function was measured by the previously mentioned dye test. The following is quoted from the results:

1. Vinyl ether anesthesia in normal dogs does not alter the liver function appreciably. In those cases in which cyanosis is a feature of the anesthesia, moderate liver damage occurs, which is not due directly to the drug but to the associated anoxemia.

2. Vinyl ether anesthesia does not enhance the liver function damage produced previously by the inhalation of chloroform, nor does it delay the period of recovery from this damage.

3. The effect of vinyl ether anesthesia on the liver function in partially starved dogs is not appreciably different from that produced in normal animals.

The problem of the effects of anesthetics on the liver has been approached in another manner by Dr. Hans Molitor [6] of the Laboratories for Pure Research, Merck & Co. He inserts cannulas in the bile duct and in the duodenum of rabbits, then he collects, measures and weighs the bile and reinjects it into the duodenum. The bile passes a drop recorder before being collected, so that the slightest change in the bile secretion may be recorded. In a control animal, the bile flow over a period of four hours shows a pronounced decrease during the first hour and a very slow and gradual increase during the following two hours. When chloroform is administered to such an animal, he records an immediate decrease in bile secretion, which continues after the anesthetic has been withdrawn. When ethyl ether is used, he finds a very slight initial decrease and a subsequent increase in the flow of bile, not unlike that of the control animal. When such an experiment is done with vinyl ether, whether the material is pure or impure, there is no change in the usual flow of bile, even though the administration lasts for two hours and the anesthesia is profound. Dr. Molitor has gone on to show the powerful effects of anoxemia in this regard. He applies a mixture of 95 per cent nitrous oxide and 5 per cent oxygen and obtains a prompt drop in the flow of bile; in fact, the secretion comes almost to a stop. At this point he changes to a mixture of 80 per cent nitrous oxide and 20 per cent oxygen, along with a sufficient amount of vinyl ether to produce very deep anesthesia, and in spite of the vinyl ether the bile starts to flow again, reaching its normal rate within five minutes.

Seemingly antithetical to these five sets of favorable observations concerning the actions of vinyl ether on the liver, there is a brief account in a footnote of one of the afore-mentioned papers [4] of two cases presenting "evidence of central lobular necrosis of the liver." These cases were reported through the kindness of Dr. Dean Lewis of the Johns Hopkins Hospital. I have obtained permission from Professor Lewis to publish the following more extended details of these two fatalities:

Mrs. H. G., white, aged 23, admitted to the accident room at 10 p. m., July 11, 1933, complained of abdominal pain of two days' duration. The patient was obese, weighing 76 Kg., had a sallow complexion and was obviously sick. The abdomen was pendulous and full, with definite tenderness on deep pressure in the right lower quadrant. There was nothing striking in the rest of the physical examination. The throat was clear, the lungs appeared normal, and the heart was of normal size with an apical blowing systolic murmur. There was no peripheral edema. The blood pressure was 110 systolic, 65 diastolic. The white blood cells numbered 19,250. The diagnosis was appendicitis.

An exploratory laparotomy with appendectomy was performed July 12, 1933, under divinyl ether anesthesia. The induction period was eight minutes. The patient was mildly hysterical and noncooperative prior to anesthesia, but induction was smooth and rapid and there was no anoxemia. Complete relaxation was easily obtained, but an amount in excess of the usual dosage of divinyl ether was required. The operation was completed in one hour and thirty-five minutes, and 275 cc. of the agent was used. The patient was fully conscious six minutes after cessation of anesthesia.

The immediate postoperative course was uneventful, with the exception of slight nausea and vomiting on the second day. On the fourth and fifth days the patient complained of heartburn, pain in the chest and headache. The physical examination was negative, with the abdomen soft. Early on the sixth day the pulse rose to 160, with respirations to 35 or 40, and the patient became unresponsive, the arms were spastic and the pupils dilated but reacted to light. The white blood cells numbered 30,000. The respirations gradually slowed and the patient died in midafternoon in apparent respiratory failure. The impression was cerebral vascular accident, involving the basal nuclei or multiple fat emboli. The autopsy showed a slight fat embolism, with midzonal necrosis of the liver, an acute splenic tumor, chronic cystitis which was slight, a small ulceration of the vaginal mucosa, a wide foramen ovale, and hematoma and necrosis of the subcutaneous tissue around the operative wound.

J. H. R., a white man, aged 54, admitted to the hospital, July 18, 1933, complained of epigastric discomfort after meals and loss of from 15 to 20 pounds (6.8 to 9 Kg.). Physical examination was negative except for the loss of weight, the ventral hernia and bilateral inguinal hernia, and very slight tenderness on deep pressure in the epigastrium. The liver was not enlarged. The blood pressure was 165 systolic, 90 diastolic; hemoglobin was 42 per cent. The white blood cells numbered 8,400. The urine showed albumin one plus. Transfusion of 500 cc. of citrated blood increased the hemoglobin to 62 per cent. The operation was performed July 25. A resection of the stomach with gastro-enterostomy was done under divinyl ether anesthesia, 350 cc. The duration of the operation was two hours and forty minutes. The operation revealed a large carcinoma of the stomach posteriorly with several small suspicious pinpoint white spots in the liver. The patient left the table in good condition and was fully conscious ten minutes after completion of the operation. The induction was rapid

2. Rosenthal, S. M., and White, E. C.: Clinical Application of the Bromsulfalein Test for Hepatic Function, J. A. M. A. **84**: 1112 (April 11) 1925.

3. Leake, C. D.; Knoefel, P. K., and Guedel, A. E.: J. Pharmacol. & Exper. Therap. **47**: 5 (Jan.) 1933.

4. Goldschmidt, Samuel; Ravdin, I. S.; Lucke, Baldwin; Muller, G. P.; Johnston, C. G., and Ruigh, W. L.: Divinyl Ether, J. A. M. A. **102**: 21 (Jan. 6) 1934.

5. Bourne, Wesley, and Raginsky, B. B.: Brit. J. Anaesth. **12**: 62 (Jan.) 1935.

6. Molitor, Hans: Personal communication to the author.

and smooth, with no cyanosis. Maintenance anesthesia was light throughout, and the patient was satisfactorily relaxed for the surgeon. The physical condition was excellent the evening of the operation with the temperature 100 F., pulse 98 and respiratory rate 20. There was no nausea or vomiting. On the second postoperative day the temperature was 101, pulse from 110 to 130, and respiratory rate 24. The patient was drowsy but quite comfortable. He voided 125 cc. of bloody urine. On the fourth postoperative day at 2:30 a. m. the patient died suddenly in apparently normal sleep with no previous changes in temperature, pulse or respiratory rate. The impression was sudden massive hemorrhage. The autopsy report was localized peritonitis; central and midzonal necrosis of the liver; pulmonary edema; adenoma of the prostate; pyelitis cystica; extreme mononuclear infiltration of papillae and pyramids of the kidney: solitary calcified tuberculous nodule in the left upper lobe.

In each case the divinyl ether was administered by the open drop method, a chloroform mask with eight thicknesses of gauze being used. No oxygen was used and there was no anoxemia at any time in either case.

Although it is true that the first case showed midzonal necrosis, it is pointed out that when liver necrosis does follow anesthesia it usually occurs at the center of the lobule; and whereas in the second case there was central as well as midzonal necrosis of the liver, this man was very wasted, very anemic, had a large carcinoma of the stomach with suspicion of metastases in the liver, and was subjected to an operation that lasted two hours and forty minutes. In fairness it must be conceded that his was a hazardous outlook and that the liver necrosis may not be attributed too seriously to the vinyl ether.

Since the previously mentioned 152 vinyl ether anesthesias there have been 500 more in this clinic, making a total of 652 administrations of vinyl ether to parturient women of all kinds and conditions. Among all these there was only one case which was followed by untoward results:

A primipara, aged 23, due March 19, 1935, was admitted to the hospital February 27 in indifferent labor. Pregnancy had been apparently normal throughout. Labor progressed normally and the patient was delivered spontaneously of a living child. Vinyl ether was given for forty minutes. Some thirty hours later a jaundice developed, which increased daily. Analyses of the blood showed rapidly increasing urea, uric acid, nonprotein nitrogen and the van den Bergh reaction indirect. Urinary output dropped to practically zero; the patient became first restless and then comatose; the jaundice deepened; blood transfusions and injections of salines and dextrose intravenously seemed to do no more than prolong life. After five days of illness she died. The last figures of chemical analyses of the blood were: urea 1.75; urea nitrogen 140; uric acid 21.4; creatinine 11.0; amino acids 18.1. The van den Bergh indirect reaction was 30 units. Postmortem examination was refused, but a small piece of liver was obtained through an abdominal incision. Prof. T. R. Waugh of the Pathological Institute of McGill University gave the following report: The specimen consisted of two pieces of liver the size of lima beans, yellowish green with red punctate markings. Section showed a hemorrhagic necrosis of the parenchyma, which started about the periportal spaces and invaded a zone of the lobule, varying from 3 to 6 cells deep in this area. The remaining parenchyma showed some fatty metamorphosis. The picture agreed with that encountered in eclampsia.

The anatomic summary was periportal hemorrhagic necrosis (eclampsia).

Having now obtained more exact knowledge of the pathologic changes concerning the two deaths at the Johns Hopkins Hospital just mentioned, and with Professor Waugh's report before me, I feel justified in the belief that vinyl ether was not the cause of the liver damage in any of these three cases. Although I do admit that it probably did enhance liver impairment in the first two anesthesias, which were unusually long, it is very likely that the results would have been the same had ethyl ether been the anesthetic. This opinion is expressed because it has already been clearly shown from repeated experiments that vinyl ether does not effect any more impairment of hepatic function than does ethyl ether. In these experiments there were no complicating factors and the conditions were under absolute control. Who can say with any sense of assurance that the livers in these three clinical cases were not diseased before the administration of vinyl ether?

Another argument in favor of vinyl ether has recently come from the Pharmacological Laboratory of the University of California Medical School. Peoples and Phatak [7] made a comparative study of the effects of ethyl ether, ethylene and vinyl ether on rabbit intestine. They found that whereas ethyl ether always caused an immediate and marked loss of tone and inhibition of movement of the intestinal muscle, and ethylene caused a slight and transitory loss of tone with an occasional increase in the amplitude of contraction, vinyl ether uniformly increased the tonicity of the intestine. They conclude that their observations on the action of vinyl ether on isolated intestinal muscle indicate that in this respect, as in other phases of its pharmacologic action, it has properties resembling ethylene more than ethyl ether. Indeed, since it definitely increases intestinal muscle tonus, it may be expected to be followed by even less postoperative stasis when used clinically than ethylene, which is reputedly so much better in this desideratum than ethyl ether. This would seem to be a point in favor of the use of vinyl ether in operative obstetrics, especially cesarean section, as against ethyl ether.

In verification of this work of Peoples and Phatak, Molitor [6] has shown me a tracing of intestinal action recorded by the method of Straub,[8] which shows that vinyl ether does not interfere with the automatic movements of the intestine, whereas ethyl ether will stop these movements. Molitor has done similar experiments on the uterus; he finds that, like ethyl ether, vinyl ether does not affect uterine contractions, which supports the impressions received in this clinic.

Since the more extended employment of vinyl ether in this clinic, with the exception of the case of eclampsia already described, there has been no question of untoward effects; its entire suitability for use in obstetrics has become very convincing, and although those patients who have had it by the "open" method have done well enough, there can be no doubt that it is better to administer vinyl ether with oxygen, if for no other reason than that every anesthetist knows something of the benefits of adding oxygen to anesthetic vapors. Ravdin [9] states that "there is no doubt that the increase of necrosis in the experimental animal is markedly reduced when a plentiful supply of oxygen is at hand." The extreme volatility of vinyl ether is such that it is very wasteful to give it by the "open" method. It is therefore preferable to employ a closed-system apparatus, fitted for supplying oxygen and for absorbing carbon dioxide, so that a very small quantity of anesthetic will suffice for the longest case; in other words, the longer the anesthesia the smaller will be the

7. Peoples, S. A., and Phatak, N. M.: Proc. Soc. Exper. Biol. & Med. **32**: 378 (Nov.) 1934.
8. Straub, W., and Viaud, P.: Arch. f. exper. Path. u. Pharmakol. **169**: 1, 1932.
9. Ravdin, I. S.: Personal communication to the author.

quantity used per unit of time. Such an apparatus should be cheap and should in a short time more than pay for itself by precluding waste of material.

SUMMARY

1. When vinyl ether is used to produce anesthesia sufficient for obstetric procedures, it apparently does not cause liver damage nor does it interfere with muscular activity in the intestine and in the uterus.

2. Vinyl ether seems to be particularly suitable for obstetric anesthesia in general practice on account of its safety for mother and child, its ease of administration, the rapidity of its action, the satisfactory maintenance of any desired degree of narcosis, and the early uneventful recovery.

3. Although vinyl ether may be given with relative safety by the "open drop" method, it is preferable to administer it in a "closed" manner with oxygen.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. GWATHMEY AND MC CORMICK AND DR. BOURNE

DR. R. A. GAUHAN, Hazelton, Pa.: I will confine my discussion to the rectal ether anesthesia as worked out by Dr. Gwathmey. For the past twelve years in our hospital we have been using the rectal oil anesthesia in obstetrics. We transferred it to the surgical department, so that in conjunction with Dr. Gwathmey we worked out a technic of rectal anesthesia plus the use of morphine and magnesium sulfate which has been very successful. We use this type of anesthesia in all our thyroid work. Our technic is as follows: Preceding the operation the patient is given two soapsuds enemas, one at 9 o'clock the night before, the other at 5 a. m. One hour before the operation the patient is given three ampules, each 2 cc. representing morphine sulfate one-eighth grain (0.008 Gm.) and solution of magnesium sulfate 50 per cent, intramuscularly at fifteen-minute intervals. Following the injection of the last dose, 1½ ounces (45 cc.) of ether with 2 ounces (60 cc.) of olive oil, thoroughly mixed, is slowly injected into the bowel and retained. If the patient is very light in weight we use 1 ounce (30 cc.); for those a little heavier we use an ounce and a half. We seldom go any higher than an ounce of ether by bowel. The patient is then moved to the operating room. At the beginning of the operation approximately 3 cc. of a 1 per cent solution of procaine hydrochloride is injected into the skin. Immediately after operation a colonic irrigation of tepid water is given until the return is clear. Following this 10 ounces (300 cc.) of dextrose solvent 5 per cent with 1 drachm of aqueous solution of iodine (Lugol's solution) is given by bowel every six hours for four doses. Fowler's position, physiologic solution of sodium chloride by hypodermoclysis, digitalin and morphine sulfate are given as a routine. Liquids are given by mouth as desired. We have not had one death from this anesthesia in 1,500 operative cases in the past ten years in the City Hospital. There is no effect on the respiratory center or the heart. The blood pressure remains constant. The patient comes to the operating room calm, a big help in toxic goiter cases. There is perfect anociassociation. The patient is able to talk during the operation and never loses consciousness. This is a big factor in operating on thyroids, as the danger of injuring recurrent laryngeal nerves is markedly lessened. There is less hemorrhage in this type of anesthesia. Breathing is regular, and there is no collection of mucus in the throat, or coughing. The patient is longer without pain. When seen in the ward in the evening the patients will say that they haven't any pain. There is much less nausea and vomiting. I am indeed indebted to Dr. Gwathmey for his help in developing our technic of synergistic analgesia.

DR. LYLE G. MCNEILE, Los Angeles: While for a normal delivery or a cesarean section the agent need only be capable of maintaining its effect in the upper level of third stage anesthesia, for a breech extraction anesthesia must be pushed to the second level, while version and vaginal hysterotomy require that the patient be brought down to the third level of third stage anesthesia. Again in obstetrics there exist as constant factors a rise in the basal metabolic rate during labor, pain and emotional excitement, each of these directly influencing the physiologic effects of nearly all the anesthetic agents. Finally, in obstetric anesthesia one must consider not only the effect of the particular anesthetic agent used on the individual to whom it is given but also the immediate and remote effects on the child. In my opinion these varying demands, the physiologic factors influencing the action of the various anesthetic agents used in obstetrics and the limitations of these same agents are responsible for the wide variations of opinion regarding the choice of anesthesia. My associates and I have used rectal ether and oil, or some modification, since its introduction by Gwathmey and Davis. It is used in both the outdoor and indoor services. First given according to the original technic described, we soon discontinued the use of magnesium sulfate as having no noticeable effect. Later we substituted dial-Ciba for the morphine, with increasingly satisfactory results. More recently we have been using pentobarbital sodium and scopolamine instead of the original morphine and magnesium sulfate. Amnesnia has been greatly increased. I regard the method after many years of trial under varying and often adverse conditions as entirely safe, and one to be highly recommended for general use.

DR. JOSEPH B. DE LEE, Chicago: It seems to me that it is much more sensible to anesthetize that portion of the patient on which one is going to operate than to desensitize the whole patient. The two elements in successful anesthesia are the mind and the body. In topical anesthesia the anesthetizer and the anesthetic are one, and this one should compose both the mind and the body of the patient. Mind treatment is essential in all anesthesia. I might say that Dr. McNeile would get better results with his local cesarean sections if he used mind treatment; in fact, that is a large part. If completely painless labor is the goal, every woman must be delivered under ether or gas by cesarean section or possibly by local anesthesia after her mind is treated. If the woman is to be delivered from below, the labor must have been present long enough to be thoroughly established, so that the anesthetics will not stop the process of delivery. Is there any anesthetic that will allow all pain to be safely abolished from this point? No, there is not. The barbiturates, morphine, dilaudid, chloroform, scopolamine, cyclopropane, tribrom-ethanol, all increase the mortality and morbidity of labor for mother and baby. They prolong the first stage, they increase the necessity for operative intervention, and the deep anesthesias under which nearly all babies are delivered nowadays cause asphyxia, postpartum hemorrhage and bronchitis, which may lead to local infections or pneumonia or to something worse. But I hasten to add that analgesics and anesthetics given properly actually reduce the dangers of labor. First, they help the mind, and labor is not such a deep psychic insult on impressionable persons; secondly, they prevent premature and harmful intervention by the doctor. He is therefore not affected by the cries of the woman and the importunities of her relatives. He allows the labor to take a more natural course. A high head comes down into the pelvis, the cervix is permitted to dilate fully, and the doctor is not precipitated into action. I believe that physicians should not aim at a completely painless delivery but should administer analgesics and anesthetics freely in the first stage, and, in the second stage, effect a delivery under ethylene gas or preferably local anesthesia. Throughout, and beginning during pregnancy, the mind should be brought into a psychologically normal condition.

DR. CARROL J. FAIRO, Cincinnati: I should like to ask just two questions of Drs. Gwathmey and McCormick. What has been their experience with proctitis after rectal ether instillation? Secondly, I notice that otologists are now very suspicious of large doses of quinine having some effect on the hearing apparatus of the new-born child. I should like to ask what their reaction is to this complaint of the otologists.

DR. H. F. BECKMAN, Indianapolis: I think that the picture portrays the results obtained by rectal ether analgesia better than words can relate. Its safety is a great factor. The dose of ether used, 2½ ounces (75 cc.), I do not think any one would challenge as a toxic dose, and it will not be repeated until again demanded or required. I believe that using the patient as the index for the degree of suffering is certainly appropriate and practical. No one in this presentation has considered the child. There is no specified time to direct the physician or to explain

what is depressed breathing or delayed breathing in the newborn child. There is a certain amount of depression in all births for the child. This manifests itself either as asphyxia or as shock. I have recently had reviewed about 870 cases for this principle. The criterion of asphyxia and depressed respiration was not clearly analyzed, but out of this number it was decided that morphine and scopolamine were the greater depressants, manifesting themselves on the child in about 30 per cent of the cases. I think that Shute and Daily of the Chicago Lying-in Hospital showed that the greatest effect of morphine manifests itself on the child during the third hour. Hence in administering these drugs it is wise to observe this time limit. With ether, however, this depressing effect was not observed. This was present in only perhaps 8 per cent of the cases. Hence I like the result obtained by this method and feel that it can be recommended as regards its safety for both mother and child.

DR. MABEL H. OTIS, Moline, Ill.: The biggest problem in obstetrics was defined by Dr. De Lee when he said it is the mental treatment. It is the fear with which this supreme effort is approached. If that could be relieved, the anesthetic would not be a matter of utmost importance.

DR. WESLEY BOURNE, MONTREAL: Vinyl ether would seem to be more useful to general practitioners than to those obstetricians who have the facilities for indulging in the better anesthesia which a large clinic should afford. Vinyl ether would seem to offer an opportunity for replacing the much more dangerous chloroform. It is equally rapid in its action, or rather more so; one or two inhalations of vinyl ether vapor are sufficient to relieve the pains of labor. Almost any one can give vinyl ether with much greater safety than when chloroform is given even with special care. Chloroform should be banished and relegated to a historical position.

DR. C. O. MCCORMICK, Indianapolis: I recommend the use of rectal ether as a basic analgesic before cesarean section, especially if the section is done under local anesthesia. If inhalation anesthesia is employed, whether ether or one of the gas anesthetics, approximately only half the usual amount is necessary. Because of the narrow margin of safety, chloroform should never be used in conjunction with rectal ether. While formerly there was an occasional rectal irritation following rectal ether, since substituting a 5 to 10 per cent (1 heaping tablespoonful to 1 quart of water) sodium bicarbonate enema for the soapsuds enema, its occurrence has been greatly minimized. As to the auditory effect of the quinine on the infant, I cannot cite figures to bear one way or the other. I know of one authority who reports 1,000 cases in which he uses 30 grains (2 Gm.) of quinine per instillation, repeating as indicated. That the risk is quite light is evidenced by absence of increased deafness in the South, although countless malaria-infected expectant mothers partake freely of large quantities of quinine. No case of auditory injury in the child has come to our attention. By carrying the patient far into active labor under the influence of pentobarbital sodium, quinine can be wholly omitted without disadvantage.

DR. JAMES T. GWATHMEY, New York: Ether by inhalation is absolutely contraindicated for tuberculous patients. I have given ether by rectum, 2½ ounces (75 cc.) three times a week for six months, to a tuberculous patient, with the idea that ether given in that way might affect the tubercle bacillus. It had no effect, either good or bad, so I discarded it, although the patient seemed to think it did her lots of good. Her chart showed no change whatever. I have given it by rectum to patients with heart disease with no bad effects. Lundy of the Mayo Clinic has stated that, if the patient has one good kidney, he doesn't hesitate to give ether by rectum. Two and one-half ounces of ether by rectum cannot be considered an anesthetic; it is an analgesic. The patient is never carried to the stage that an anesthetist is required. Even in a patient weighing 100 pounds (45 Kg.) it is an analgesic pure and simple. For that reason I think that it is perfectly safe.

Syphilis.—Aortic aneurysm is the most frequent mediastinal tumor and may have no signs whatever. It is the part of wisdom to consider every patient known to have syphilis as a potential case of cardiovascular syphilis.—W. D. Reid, quoted by Fisher, Alexander: Aphorisms in Clinical Medicine, *Canad. J. Med. & Surg.* **77**:166 (June) 1935.

THE USE OF BENZEDRINE FOR THE TREATMENT OF NARCOLEPSY

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Benzedrine (β-phenylisopropylamine) is a sympathomimetic compound closely related to ephedrine and epinephrine (fig. 1). Pharmacologic studies indicated that this compound has a more stimulating effect on the higher centers of the central nervous system than ephedrine, as manifested by its ability to awaken experimental animals from intraperitoneal barbital anesthesia and by its insomnia-producing effect in human beings.[1] For this reason it was thought that it would be of interest to try this compound in clinical conditions in which this type of action would be desirable. Moreover, the compound seemed particularly suited for such application because of its low toxicity, its small cost and its prolonged action, as well as because of the fact that its side effects, such as stimulation of the peripheral sympathetic system, are not marked.[2]

Narcolepsy was chosen as the condition to be studied because the stimulation of the central nervous system induced by ephedrine has been found to be of therapeutic value in this disease.[3] The effect of benzedrine in other neurologic conditions, especially certain forms of asthenia, is now being studied.[4]

Nine patients with typical histories of narcolepsy were selected for study. In all instances the disease was well established and the patients fell asleep at least three times a day. In seven instances cataplexy and other conditions associated with narcolepsy were present. Seven of the patients had been taking ephedrine in the usual therapeutic doses for a considerable period of time, but only one obtained complete relief from the symptoms. Five noticed some improvement, and one, no improvement.

Of the nine patients treated, four were hospitalized for more accurate control. Throughout the period of the experiment on these patients they were kept in ignorance of the medicine they were receiving and of the changes in the dosage, in order to rule out any psychic effect. Since both benzedrine and ephedrine, in aqueous solution, have a salty taste, the patients were given physiologic solution of sodium chloride by mouth at the regular medication time when they were not taking either of the effective drugs. Careful record was kept, with the assistance and cooperation of the

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Dr. Prinzmetal is National Research Council Fellow in Medicine.

Benzedrine is the name in New and Nonofficial Remedies for an ephedrine-like compound described as racemic desoxy-nor-ephedrine or as racemic benzyl-methyl carbinamine. It has been supplied under the names phenylisopropylamine and β-phenylisopropylamine.

From the Thorndike Memorial Laboratory, Second and Fourth Medical Services (Harvard), Boston City Hospital and the Department of Medicine, Harvard Medical School; and the Neurological Service, Boston City Hospital, the Department of Neurology, Harvard Medical School, Boston, and the Department of Internal Medicine, Washington University School of Medicine, St. Louis.

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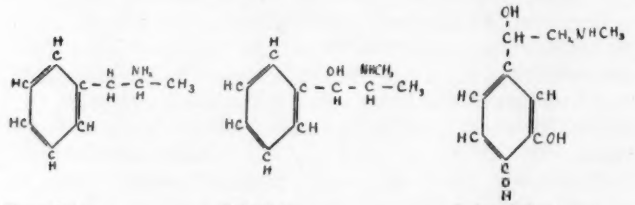
patient, of the number and duration of sleep attacks each day, as well as of attacks of cataplexy. At the start of each experiment, to establish a level and for a control, the patient was given physiologic solution of sodium chloride for a period of from three to seven days. Then for several days, varying doses of benzedrine (phenylisopropylamine hydrochloride)[5] were administered, followed by equivalent doses of



Benzedrine. Ephedrine. Epinephrine.

Fig. 1.—Comparison of chemical structure of benzedrine, ephedrine and epinephrine.

ephedrine sulfate[6] for several days. Then, for a final period, benzedrine was again given.

The dosage of benzedrine varied from 10 mg. once daily to 40 mg. three times a day, depending on the age of the patient and the severity of the disease. The five ambulatory patients could not be so carefully controlled, but with them also benzedrine and ephedrine were alternated, without their knowledge of the change.

RESULTS

In all instances complete relief from the attacks of sleep, and practically complete relief from cataplexy, resulted when suitable doses of benzedrine were given (as shown in the table and in figure 2). On an average, this compound was approximately three times as effective as ephedrine. In four instances huge single doses of ephedrine, as high as from 80 to 150 mg., failed to give relief, while moderate doses of benzedrine, such as 30 mg., afforded complete relief from symptoms. In only one instance (case 8) did ephedrine prove as effective as benzedrine; in no instance did it prove more effective. No diminution in the effectiveness of benzedrine has been observed as a result of its use over comparatively long periods of time. Patient 2 has been taking this compound for fourteen months and still obtains complete relief from symptoms.[7]

UNTOWARD SYMPTOMS

In several instances the patients complained that, although they did not fall asleep during the day, they also could not sleep at night. This was remedied by giving a smaller or no evening dose. Patients 7 and 9 complained of hyperexcitability and marked restlessness and showed evidence of overstimulation of the central nervous system, as manifested by dilated pupils and inability to relax. Reduction of the dosage resulted in disappearance of these troublesome symptoms but still gave complete relief from the narcolepsy.

There appears to be some individual variation in response to benzedrine. In order to avoid untoward symptoms, therefore, it is best to start with small doses of 10 mg. and gradually increase the amount until the optimal effect is obtained.

5. The benzedrine was kindly furnished by Dr. Gordon Alles of Los Angeles, and the Smith, Kline and French Laboratories of Philadelphia, to whom we are indebted for their cooperation.

6. Ephedrine sulfate 1.25 mg. is equivalent to benzedrine (phenylisopropylamine hydrochloride 1 mg.).

7. Dr. William L. Long of Philadelphia has kindly informed us of a patient of his with narcolepsy who has received benzedrine with relief of symptoms. We have ourselves had four additional cases, not so carefully controlled or long enough followed to warrant inclusion in this study, in which complete relief from narcolepsy has been obtained by the use of benzedrine.

CONCLUSIONS

1. Benzedrine has a profound stimulating action on the higher centers of the central nervous system.

2. In nine cases of narcolepsy complete relief of attacks of sleep, and practically complete relief of cataplexy, was obtained when suitable doses of benzedrine were given.

3. Comparative studies indicate that benzedrine is approximately three times as effective as ephedrine in preventing attacks of sleep in narcolepsy, and that in some cases it gives complete relief from symptoms that are not relieved by huge doses of ephedrine.

REPORT OF CASES

CASE 1.—J. S., a 26 year old Negro male student, had sleep attacks for one year. These occurred whenever he was quiet. There had been at least three sleep attacks daily. He had noticed occasional momentary spells of "drawing up" of his leg muscles and had had occasional headaches. In 1918 he had influenza and probably encephalitis. In the past two years he had grown extremely rapidly. Physical examination showed obesity with female fat distribution. Otherwise the examination was essentially negative. The basal metabolic rate was —19 per cent and —22 per cent. The diagnosis was narcolepsy with cataplexy, ? postencephalitic. Previous treatment with thyroid extract had given only slight relief. Ephedrine, 25 mg. three times a day, had given complete relief.

Experimentally, he was given benzedrine 10 mg. three times daily, with complete relief. He stayed awake without any attacks of drowsiness or sleep, except on a few rare occasions when he neglected to take his medicine. Once, without his knowledge, he was given a placebo instead of the benzedrine, and all his symptoms returned.

CASE 2.—W. L., a 21 year old white male student, had frequent sleep attacks for the past six years, so that his school work and athletic activities suffered. He had gained 30 pounds (13.6 Kg.) in a relatively short time and had an insatiable appetite. He was well developed and slightly obese and had a stupid expression, which faded when he was stimulated by interest. The skin and hair were delicate, and there was absence of body hair. The neurologic examination was essentially negative. A roentgenogram of the skull, centered over the sella turcica, was negative. The basal metabolic rate was —23 per cent. The sugar tolerance curve was normal. The diagnosis was narcolepsy. Previous treatment with 260 mg.

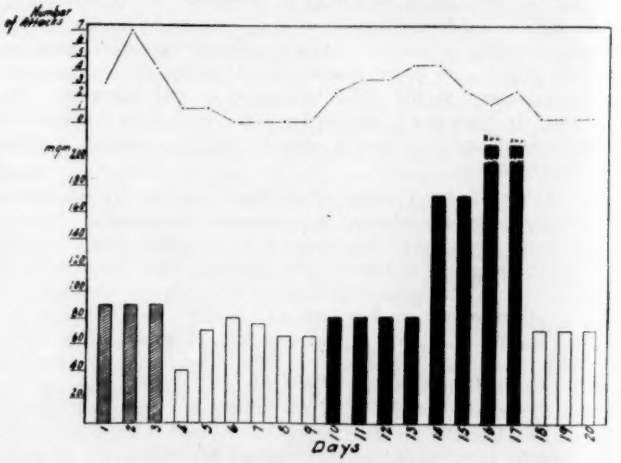


Fig. 2.—Comparative effect on number of narcoleptic attacks of benzedrine and ephedrine in case 9. Upper block shows number of daily attacks of sleep; lower block shows medication used and dosage. Shaded columns, physiologic solution of sodium chloride; white columns, benzedrine; black columns, ephedrine.

of thyroid extract daily gave only slight relief from symptoms. Ephedrine 25 mg. every six hours during the day relieved him at first almost completely but after three months was only slightly effective.

Experimentally, benzedrine 20 mg. daily gave complete relief from all symptoms. After fourteen months the same dose continued to be fully effective.

CASE 3.—G. McD., a 19 year old white male student, received a blow on the head in a football game three years before. That night he had an attack of momentary weakness of the legs and fell down. This was followed by attacks of drowsiness and sleep of gradually increasing frequency, until he was having about six attacks daily. He had also momentary generalized weakness whenever he laughed. He had had difficulty with his school work because of these symptoms. Physical examination and neurologic examination were essentially negative. Laboratory studies were negative. The diagnosis was narcolepsy with cataplexy, post-traumatic. Before he was seen by us, the patient had taken ephedrine with moderate relief for a short time, followed by rapid diminution in its effectiveness until no relief was obtained.

During this study, he was given 75 mg. of benzedrine daily, with complete relief from his sleep attacks and practically complete relief from his cataplectic attacks. He states that he can concentrate on his school work, which he is now successfully completing. He was given ephedrine experimentally, without his knowledge of the change. Single doses of 187 mg. of ephedrine were necessary to keep him awake, smaller doses being unsuccessful.

CASE 4.—R. K., a 24 year old white female houseworker, had sleep attacks for ten years, occurring from three to six times daily. She also had generalized momentary weakness when she laughed. She had had to give up school because of her symptoms and was doing housework in a friend's home. Physical examination and neurologic examination were essentially negative. Blood, urine and roentgen studies were all negative. The basal metabolic rate had been —14 per cent, —18 per cent, —27 per cent and —25 per cent on different occasions. The diagnosis was narcolepsy with cataplexy. Previous treatment with thyroid extract made her feel better when awake but did not influence the number of sleep attacks. Solution of pituitary was also given, without effect. Ephedrine, 100 mg. daily, gave some relief, but she still slept at least once every day; ephedrine relieved the cataplectic attacks completely.

The patient was hospitalized for study. During a control period on physiologic solution of sodium chloride she averaged seven sleep attacks daily. On 90 mg. of benzedrine daily for five days she fell asleep on only one occasion. For a period of eleven days she was then given ephedrine in gradually increasing doses up to 242 mg. daily, and she fell asleep at least once every day. In a final four day period on 90 mg. of benzedrine she fell asleep only once. Complete relief from cataplexy also resulted.

She has been seen since leaving the hospital and six months after beginning benzedrine treatment. She reports complete relief from both sleep attacks and cataplexy.

CASE 5.—H. M., an 11 year old white schoolboy, had sleep attacks for two years. He had slept all the time he was not actively occupied, also. He had failed his school work because, his teacher said, he could not keep awake. There had been no cataplectic attacks. Physical examination and neurologic examination were essentially negative. Blood and urine examinations were negative. The diagnosis was narcolepsy. Previous treatment with thyroid, 120 mg. daily for three weeks, had no effect on his attacks. Sedatives did not relieve his symptoms.

For a control period he was given physiologic solution of sodium chloride and he slept from three to four times daily. He was then given benzedrine, 36 mg. and later 24 mg. daily, with complete relief from symptoms. When the dose was reduced to 12 mg. daily for three days, he fell asleep once a day. On the following two days, during a vacation, he neglected to take any medicine and reported that he "slept all day." During the next eighteen days, taking 24 mg. of benzedrine daily, he did not sleep except on two occasions when he vomited his dose of medicine immediately after taking it. In the following five days he was given 30 mg. of ephedrine daily and slept at least twice each day. For the next nine days he took 48 mg. of ephedrine daily and slept at least once each day. Finally, in a period of two weeks on 24 mg. of benzedrine, he slept only on two occasions when he neglected to take his dose on time. Eight months after starting treatment, he reports that he has fallen asleep only when he has neglected to take his medicine. His teacher reports that he now stays awake in school and will be promoted this year.

Comparison of Effectiveness of Benzedrine and Ephedrine in Entire Series of Nine Cases

						During Experimental Period						
Case	Age	Sex	Duration of Disease	Cataplexy	Sleep Attacks Daily	Daily Dose of Ephedrine, Mg.	Effectiveness of Ephedrine	Daily Dose of Benzedrine, Mg.	Effectiveness of Benzedrine	Time Followed	Estimated Ratio of Effectiveness of Benzedrine to Ephedrine	Comment
1	16	♂	1 yr.	Yes	3-6	...	.....	30	Complete relief	1 month	.....	? postencephalitic
2	21	♂	6 yrs.	No	2-4	92	Complete relief for one month, then gradual decline; end of 3 months, slight relief	20	Complete relief	14 months	4.5:1	
3	19	♂	3 yrs.	Yes	3-4	187	Complete relief of sleep attacks, nearly complete of cataplexy	75	Complete relief of sleep attacks; nearly complete of cataplexy	4 months	2.5:1	Post-traumatic; previously had taken ephedrine with moderate relief for short period, followed by no effect
4	24	♀	10 yrs.	Yes	3-6	244	At least one sleep attack daily	90	Complete relief	4 months	2.5:1	Had ephedrine before beginning this study, at first with complete relief, but soon began to fall asleep
5	11	♂	2 yrs.	No	3-5	48	At least one sleep attack daily	24	Complete relief	4 months	2:1	
6	34	♂	10 yrs.	Yes	2-5	187	Only rarely a full day without an attack	10	Complete relief	4 months	At least 5:1	
7	18	♂	3 yrs.	Yes	6-10	...	.....	40	Complete relief	2 months	...	Usual dose prevented night sleep and made him extremely irritable and anorexic
8	14	♀	3 yrs.	Yes	3-6	92	Rare attack	80	Rare attack	4 months	1:1	The two compounds apparently equally effective
9	21	♀	4 yrs.	Yes	3-6	244	At least one attack daily	70	Complete relief	2 months	3.5:1	Benzedrine at first caused irritability, which later disappeared; took ephedrine before experimental study; at first found 65 mg. effective but within a few months found 250 mg. of ephedrine not completely effective and had to leave school

CASE 6.—H. G. B., a white man, aged 34, an office worker, had sleep attacks from two to five times daily for the past ten years. He had also had frequent spells of generalized momentary weakness. These attacks of sleep so interfered with his work that he had to give it up. He was unable to concentrate and thought that his memory was failing. An embryoma of the testicle was removed three years before, but there had been no evidence of recurrence or metastasis. Physical examination was essentially negative except for the absence of one testicle. Neurologic examination showed slightly irregular pupils but was otherwise negative. The basal metabolic rate was —17 per cent and —16 per cent. The sugar tolerance curve was normal. Lumbar puncture and skull roentgenograms were negative. The diagnosis was narcolepsy with cataplexy. Ergotamine and caffeine had both been tried experimentally, with no effect. He was given ephedrine 150 mg. daily, but this was not completely effective, since only rarely did he go a whole day without a sleep attack.

Experimentally, he was given benzedrine 10 mg. daily. He reports that he has had complete relief from all symptoms.

CASE 7.—B. A., an 18 year old white male student, had from six to ten sleep attacks daily for three years. He also had frequent spells of generalized momentary weakness when he laughed. He had stammered badly since the age of 6, when his handedness was changed from left to right. One sister had epilepsy; one brother stammered. Physical examination was essentially negative. Neurologic examination was negative except for stammering. Diagnosis was made of narcolepsy with cataplexy and strephosymbolic stammering. Atropine and pilocarpine were given with no effect on the narcolepsy.

The patient was hospitalized for study. When he was given 105 mg. of benzedrine daily, his daytime sleep attacks were abolished but his night sleep was also interfered with. He became irritable and irascible, and there was loss of appetite. On 40 mg. of benzedrine daily these untoward symptoms disappeared and he had complete relief from sleep attacks and almost complete relief from cataplexy. He was seen four months after beginning treatment and reported complete relief except when he neglected to take his medicine.

CASE 8.—E. B., a 14 year old white female student, had a mild head injury three years before. Since then, she had from three to six sleep attacks daily. Whenever she laughed she suffered from momentary generalized weakness. On physical examination there was evidence of mitral stenosis. Neurologic examination was essentially negative. The red blood count was 3,000,000. Lumbar puncture was negative. The diagnosis was narcolepsy with cataplexy, ? post-traumatic; rheumatic heart disease, with mitral stenosis; hypochromic anemia.

The patient was hospitalized for study. During a control period, while taking physiologic solution of sodium chloride, she averaged three sleep attacks daily. She was given benzedrine, 80 mg. daily, and in a period of several days had only one sleep attack. Again on physiologic solution of sodium chloride she slept twice daily. She was then given ephedrine, 115 mg. daily, and in a period of a few days had one sleep attack. When again given benzedrine she had no daytime sleep attacks. There was also complete relief from cataplexy.

CASE 9.—J. C. W., a 21 year old white female student, had had sleep attacks from three to six times daily for four years. She had also had momentary generalized spells of weakness, associated with laughing. She had been forced to leave college in two successive years because she could not avoid falling asleep in class. Physical examination was essentially negative. Neurologic examination was negative except for ptosis of the right eyelid, which was congenital and familial. Laboratory examinations were negative. The diagnosis was narcolepsy with cataplexy; congenital ptosis. Previously, with ephedrine, she got fair relief, though she still fell asleep and had to leave school. She found at first that 65 mg. of ephedrine daily was effective, but within three months she had to increase the dose and when first seen was taking from 195 to 250 mg. daily and was still falling asleep at least once each day.

Figure 2 is a graphic record of the experiment in this case. The patient was hospitalized for study. During the control period, on physiologic solution of sodium chloride, she averaged four sleep attacks daily. She was given 65 mg. of benzedrine daily and had no sleep attacks. She did, however, become nervous and irritable, but this condition disappeared after two days. Then she was given gradually increasing doses of ephedrine, ranging from 82 to 242 mg. daily, and she fell asleep at least once each day. During the final period, on 70 mg. of benzedrine daily, she had no sleep attacks. She was seen five months after discharge from the hospital, and she reported that she was not having any sleep attacks at all. She very occasionally had an attack of cataplexy. She felt ready to try going back to college.

Clinical Notes, Suggestions and New Instruments

PAROXYSMAL VENTRICULAR FIBRILLATION

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Since ventricular fibrillation is practically always a terminal event, occurring just before clinical death, this case is of interest because of (1) the frequent attacks followed by recovery, (2) the effect of therapy and (3) an unusual electrocardiogram, which recorded one attack that lasted 120 seconds.

T. C., a white man, aged 68, admitted to the Germantown Hospital, May 20, 1935, complained of repeated attacks of unconsciousness. These had begun only three days before, although he had had occasional vertigo and increasing dyspnea for the past year. The past medical history was negative. Physical examination was negative except for moderate generalized arteriosclerosis. Cardiac examination showed slight enlargement to the left. The heart sounds indicated poor muscular quality. A soft systolic murmur was heard at the apex. The blood pressure was 190-200 systolic, 100 diastolic. The heart rate was from 34 to 40 with frequent premature contractions. There were no signs of congestive failure. Uri-

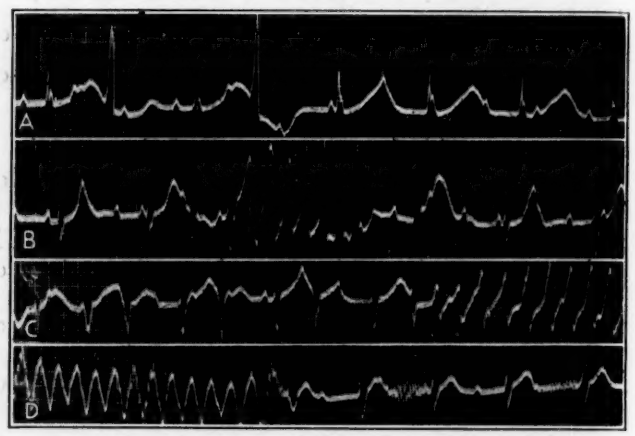

Fig. 1.—*A*, lead 1: Complete heart block with ventricular premature contractions. *B*, lead 2: A short series of ventricular tachysystoles. *C*, lead 3: Frequent ventricular premature contractions with a longer run of ventricular tachycardia, terminated in *D*.

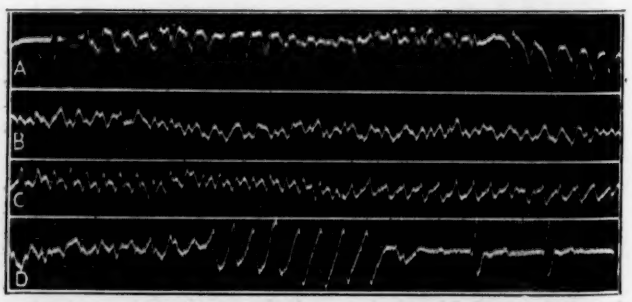

Fig. 2.—*A*, the first QRS complex seen is followed by the onset of ventricular fibrillation. A continuous strip of lead 2 was taken; *B* is cut from a section twenty seconds later, *C* at sixty seconds and *D* at the termination of the attack passing from fibrillation to ventricular tachycardia and return to the dominant rhythm, complete heart block. The entire episode measured 120 seconds.

nalysis revealed a specific gravity of 1.022, a trace of albumin and numerous white blood cells. A blood count revealed slight polymorphonuclear leukocytosis. The Wassermann reaction was negative. Blood sugar and urea nitrogen were normal. Roentgenograms showed old fibrosis of the lung fields and slight cardiac enlargement.

During the first twenty-four hours he had eighteen attacks of ventricular fibrillation ranging from twenty to forty seconds. He would become ashen, his eyes would take on a fixed, glassy stare, respirations would cease, the pulse would disappear, no heart sounds could be heard over the precordium, reflexes would be absent and there would be a loss in sphincter control. Then feeble rapid heart action could be detected, becoming stronger, respirations commence and consciousness return, and the heart would slow down to the usual rate of 32 to 36 per minute.

Figure 1 shows complete heart block with frequent ventricular tachycardia. Sedatives had no effect on lessening the frequency of the attacks, so on May 22, 5 minims (0.3 cc.) of epinephrine was given intramuscularly third hour. There was a prompt obliteration of the premature contractions that always preceded a paroxysm of ventricular fibrillation and cessation of further attacks. May 24, 2 grains (0.12 Gm.) of quinidine sulfate was given the fourth hour, and May 25 and 26, 4 grains (0.24 Gm.) four times a day. Premature contractions reappeared and the paroxysms of ventricular fibrillation recurred, becoming more frequent and longer in duration. One attack was observed on the 26th, during which no heart action could be detected for over three minutes. Another was recorded as shown in figure 2.

The quinidine was stopped and 5 minims of epinephrine was again given every third hour, with prompt cessation of attacks after the first dose and were not repeated. Epinephrine was stopped June 1 and he was entirely free until his discharge from the hospital, June 8, in good condition. Further electrocardiograms showed no appreciable change in the complete heart block and only a rare premature contraction. He continued to do well at home, was stronger, had less dyspnea and no return of attacks until six weeks later, when he was found dead, presumably in a final paroxysm. Autopsy was not obtainable.

COMMENT

There is a divergence of opinion in regard to the use of epinephrine, quinidine and digitalis in paroxysmal ventricular fibrillation.

Davis and Sprague [1] believe that a circus movement in the ventricles is responsible for the arrhythmia. When there is complete auriculoventricular dissociation, the slow rate of complete heart block is initiated by the idioventricular node. If frequent ectopic ventricular premature contractions are present, ventricular fibrillation may supervene. Both quinidine and digitalis depress intraventricular conduction time in the branch bundles and Purkinje fibers, so the administration of these drugs increases the hazard in complete heart block.

Dock [2] reports a case which was initiated by epinephrine and controlled by quinidine. Kerr and Bender [3] feel that quinidine was the causative factor in their case.

Other observers [4] have been successful in controlling paroxysms of ventricular fibrillation by intramuscular injection of epinephrine. Levine and Matton [5] report a case in which recovery followed the intracardiac injection of epinephrine.

On the other hand, Schwartz and Jezer [6] believe that epinephrine is distinctly contraindicated, since it enhances the irritability of the ventricles and stimulates the idioventricular pacemaker. However, in their experiments no premature contractions were noted during the use of epinephrine. In the case here reported, each paroxysm was preceded by an increasing number of premature contractions.

Obviously no conclusions can be drawn from single cases, but from the clinical observations in this case epinephrine would seem to be indicated to abolish these ectopic beats and quinidine contraindicated if complete heart block is present.

Alden Park Manor.

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Special Article

FOOD, DRUG, THERAPEUTIC DEVICE AND COSMETIC LEGISLATION PENDING IN CONGRESS

A CRITICAL ANALYSIS OF THE PROVISIONS OF THE COPELAND BILL [1] RELATING TO DRUGS AND PROPHYLACTIC AND THERAPEUTIC DEVICES

By THE BUREAU OF LEGAL MEDICINE AND LEGISLATION, AMERICAN MEDICAL ASSOCIATION

CHICAGO

The Federal Food and Drugs Act of 1906 was enacted nearly thirty years ago. Inherent weaknesses were recognized in it at that time, but there had been a long hard battle for even such legislation as was then in prospect and its proponents accepted the new act as the best they could get. Amendatory legislation, they hoped, would strengthen and supplement it. Some such legislation has been enacted in the long period that has elapsed since that time, but at the end of thirty years the act is recognized as an ineffective remedy for the evils that it was intended to cure and for others that have grown up.

Today a situation confronts us similar to that which confronted the proponents of federal food and drug legislation thirty years ago. The country is engaged in a struggle to procure the enactment of federal legislation adequate, when taken into consideration with the numerous other federal food and drug laws, to protect the people against fraud and against danger to health, inherent in the inadequately supervised and controlled manufacture and sale of foods and drugs, prophylactic and therapeutic devices, and cosmetics, so far as it lies within the power of the federal government to enact such legislation. Emulating the proponents of earlier legislation, the proponents of the legislation now pending, in their eagerness to procure its enactment, have made so many concessions to commercial interests, as distinguished from the interests of the consumer, that the prospect of effective legislation has been greatly diminished. There is grave danger of the enactment of an inadequate law—one that will not protect the consumer adequately, that will require expensive and prolonged litigation before it can be effectively enforced, and that may for another quarter century or more exclude from the statute books an effective law. The situation must be met now, by adequate amendments of the Copeland bill, or by the preparation of a new bill.

1. Seventy-Fourth Congress, S. 5, "An Act To prevent the adulteration, misbranding, and false advertising of food, drugs, devices, and cosmetics in interstate, foreign and other commerce subject to the jurisdiction of the United States, for the purposes of safeguarding the public health, preventing deceit upon the purchasing public, and for other purposes."

Circumstances prevent an analysis of each of the nine bills now pending in Congress for the better regulation of the manufacture and sale of foods, drugs, devices and cosmetics. The outstanding bill is S. 5, commonly referred to as the Copeland bill; it is sponsored by a senator who is a physician, it has passed the Senate, and it has been made the principal topic of discussion in the hearings held under the auspices of a subcommittee of the Committee on Interstate and Foreign Commerce of the House of Representatives. Because of its length and breadth, however, and its wealth of detail, it is impossible to give here a critical analysis even of that one measure in its entirety. This analysis will be limited, therefore, to the provisions of the Copeland bill that relate primarily to drugs and prophylactic and therapeutic devices. These are the provisions that are of primary import to the medical profession and unfortunately are probably the weakest in the bill.

Adequate standards of purity, wholesomeness and potency of foods, drugs, prophylactic and therapeutic devices, and cosmetics constitute the foundation of legislation to protect the people from fraud and from danger to health in the purchase and use of such merchandise. Adequate standards of frankness and truthfulness in labeling and advertising are likewise important. Without standards, compliance by the honest manufacturer, distributor and dealer is difficult; evasion by the dishonest is easy; administrative officers and the courts are embarrassed in their efforts to enforce the law; the cost of enforcement is increased, and the consumer suffers. So far as relates to drugs and prophylactic and therapeutic devices, the Copeland bill proposes no adequate standards.

SCOPE OF COPELAND BILL

The Copeland bill defines interstate and foreign commerce so as to make it cover not only interstate and foreign commerce, properly so called, but also commerce in the District of Columbia and the territories. The bill covers four classes of merchandise whenever and wherever they enter such commerce; namely, (1) foods, (2) drugs, (3) devices and (4) cosmetics. It proposes standards of purity and safety for foods, drugs and cosmetics, and regulations to govern the labeling and advertising of them and of devices. For foods, the Secretary of Agriculture is to be authorized to set up additional standards. For drugs, three private organizations are to have similar authority; namely, the United States Pharmacopoeial Convention, Inc., the American Institute of Homeopathy, and the American Pharmaceutical Association.

STANDARDS FOR DRUGS AND DEVICES

The Copeland bill proposes to set up certain standards of purity and potency for drugs. It proposes no standards for the soundness and potency for what the bill dominates as "devices." The labeling and advertising requirements with respect to both of these classes of merchandise are identical, so far as they are applicable to one or to the other or to both. Drugs and devices, therefore, may be considered together.

"Drugs" and "Devices" Defined.—For the purposes of the bill, the term "drug" and the term "device" are defined as follows:

Section 201. As used in this Act, unless the context otherwise indicates . . .

(*b*) The term "drug," for the purposes of this Act and *not for the regulation of the legalized practice of the healing art,* includes (1) all substances and preparations recognized in the United States Pharmacopoeia, *Homoeopathic Pharmacopoeia of the United States,* or National Formulary, *or any supplement to any of them;* and (2) all substances and preparations intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease in man or other animals; and (3) all substances, and preparations, other than food and cosmetics, intended to affect the structure or any function of the body. [2: 3-19.]

(*c*) The term "device," for the purposes of this Act and *not for the regulation of the legalized practice of the healing art,* includes all devices intended (1) for the use in diagnosis, cure, mitigation, treatment, or prevention of disease in man or other animals; and (2) to affect the structure or any function of the body. [2: 20-25.]

The foregoing definitions, it will be observed, are only "for the purposes of this Act," and "not for the regulation of the legalized practice of the healing art."

The phrase "not for the regulation of the legalized practice of the healing art" is used, according to the Senate Committee on Commerce,[2] "to make it clear that the bill is not a medical practices act and will not interfere with the practice of the healing art by chiropractors and others in the States where they are licensed by law to engage in such practice." Its full import is best understood when it is remembered that in certain states some practitioners are licensed on condition that they shall not use drugs and in some states chiropractors are limited in their practice to palpation and adjustments of the vertebrae and possibly of other tissues by hand only. If any practitioner holding such a limited license uses drugs or any chiropractor licensed to use only manual palpation and adjustment uses mechanical devices of any kind, he is guilty of violating the medical practice act and may be punished accordingly. The apparent purpose of the limiting phrase "and not for the regulation of the legalized practice of the healing art" is to prevent the law enforcement officers of any state from introducing in evidence the proposed federal definitions of "drug" and of "device" to show that a substance administered or prescribed by a supposedly drugless practitioner is in fact a drug, or to show that a device used by a chiropractor who is authorized to use only his hands is in fact a device and not a negligible incident to manual diagnosis and treatment. The limiting clause will therefore apparently tend to facilitate the fraudulent practice of drugless healing, favoring particularly chiropractic.

"Misbranding" and "False Advertisement" Defined and Prohibited.—The Copeland bill proposes to penalize misbranded drugs and devices in interstate commerce and the dissemination of false advertisements of drugs and devices in interstate commerce and in the mail. The adequacy of these prohibitions depends on the meaning of the words "misbranded" and "false" as used in them.

"Misbranded" is defined by the bill as follows:

Sec. 402. A drug or device shall be deemed to be misbranded—

(*a*) If its labeling is false or misleading in any particular. *Any representation concerning any effect of a drug or device shall be deemed to be false under this paragraph if such representation is not supported by demonstrable scientific facts or substantial and reliable medical or scientific opinion.*

Under the heading "False Advertisement," the bill says:

Section 601. (*a*) An advertisement of a food, drug, device, or cosmetic shall be deemed to be false if it is false or misleading in any particular relevant to the purposes of this Act regarding such food, drug, or cosmetic. *Any representation concerning any effect of a drug or device shall be deemed to be false under*

2. Seventy-Fourth Congress, S. Rep. 646, p. 1.

this paragraph if such representation is not supported by demonstrable scientific facts or substantial and reliable medical or scientific opinion.

The limiting sentences in both of the foregoing definitions, it will be noted, have reference solely to representations concerning the effects of drugs or devices, as the case may be. Seemingly they are intended to limit the activities of the manufacturers and venders of unworthy and unfit drugs, notably the manufacturers and venders of quack medicines. As a matter of fact, however, when interpreted in the light of the bizarre definitions of the terms "medical opinion" and "scientific opinion" embodied in the act, and as construed by the Senate Committee on Commerce, they open the door wide for fraud and danger. When it is proposed that a representation concerning the effect of a drug or device shall be deemed to be false if it is not supported by demonstrable scientific facts or substantial and reliable medical or scientific opinion, it is clearly implied that such a representation is not to be deemed false but is to be deemed true if it is so supported. And the language of the bill is such that such a representation need be supported only by (1) demonstrable scientific facts or (2) substantial and reliable scientific opinion, or (3) substantial and reliable medical opinion. In other words, even though representations concerning the effect of a drug or device are not "supported by demonstrable scientific facts," and even though they may be disproved by such facts, they are, for the purposes of this bill, to be accepted as true if they are supported by "substantial and reliable scientific or medical opinion" as that term is defined by the bill, a matter that will be discussed later. In the end, a lay jury will in contested cases judge the weight of the evidence and determine whether any of the medical or scientific opinions offered in evidence are "substantial and reliable." Obviously, the results will be uncertain.

Moreover, the bill seems to throw the burden of proof on the government; for the defendant is entitled to the presumption of innocence and before he can be convicted it must be shown beyond a reasonable doubt that a representation that he has made concerning the effect of a drug or device and that the prosecution alleges is false is not supported by demonstrable scientific facts or by substantial and reliable scientific or medical opinion. The difficulty and expense of successful prosecutions under such conditions can easily be seen. The proof of a negative is notoriously difficult; it may easily be impossible in cases arising under the foregoing provisions of the Copeland bill, if the construction placed on them by the Senate Committee on Commerce is accepted; for as construed by the committee any such representation, supported by the opinion of any "numerically significant group of competent and reliable practitioners or qualified scientists, including recognized experts in the field in question," is not to be deemed false.[3] How numerous a group must be before it becomes "numerically significant," the committee has not said. Presumably, however, there may be numerous "numerically significant groups" in any state, territory or other jurisdiction.

The difficulty of obtaining a proper judgment under this bill as to the truth or falsity of any representation concerning the effect of a drug or device is increased by the attempts made in the bill to define arbitrarily the terms "scientific opinion" and "medical opinion."

"Scientific Opinion" Defined.—For the purposes of the bill, "scientific opinion" is limited to "the opinion, within their respective fields, of competent pharmacologists, physiologists, or toxicologists." The opinions of biologists, chemists, physicists and psychologists, and of experts in all branches of these sciences and arts, are to go for naught as "scientific opinion" unless the witness whose evidence is proffered dubs himself or is dubbed by others as a "pharmacologist," a "physiologist" or a "toxicologist."

"Medical Opinion" Defined.—In contradistinction to the foregoing narrow definition of "scientific opinion," the definition of the term "medical opinion" opens a wide field:

> The term "medical opinion" means the opinion, within their respective fields, of the practitioners of *any branch of the medical profession,* the practice of which is licensed by law in the State or Territory where any drug or device, to which such opinion relates, is held, sold, or distributed.

The meaning of this definition is hidden in the bill's arbitrary definition of the seemingly simple term "medical profession," for the bill provides:

> The term "medical profession" means the legalized professions of the healing art.

Unfortunately, the bill leaves us in the dark as to what it means by the phrase "the legalized professions of the healing art." According to the Senate Committee on Commerce—

> The definitions of "medical profession" and "medical opinion" in paragraph (k) [sic] are intended to effect a definite recognition of all branches and divisions of the healing art which are licensed by law in the various States and Territories, and to provide that statements concerning the effect of drugs and devices shall be judged on the basis of the opinion of the branch of the healing art in accordance with the teachings of which they are offered. It is further intended that the laws governing medical practice of the State or Territory in which the drug is to be distributed shall prevail in determining whether the opinion of any particular branch of the healing art may be resorted to in the trial of issues arising under this act. The definition as so drawn recognizes fully the right of the States to determine for themselves, through their control of medical practice, the character of representations made for drugs and devices coming from interstate commerce for distribution within their own borders.[4]

The term "medical opinion" seems to mean, then, wherever it appears in the Copeland bill, the opinions not only of doctors of medicine and of dentists, pharmacists and registered nurses but the opinions also of chiropractors, osteopaths, naturopaths, optometrists, chiropodists and midwives, and in some states of other practitioners, according as one or another class is licensed by the laws of the state. Just how the court is to determine whether any particular drug or device is or is not within the field of any one group, or in the fields of two or more of them, and how the jury is to determine what constitutes substantial and reliable "medical opinion" when a drug or device may be within the fields of two or more such groups, are problems that the bill leaves to the courts, to solve as best they can.

The situation with respect to the misbranding of drugs and devices and the false advertising of drugs and devices may be summed up as follows: A drug or device is to be deemed misbranded if its labeling is false or misleading in any particular, and an advertise-

3. Seventy-Fourth Congress, S. Rep. 646, p. 6.

4. Seventy-Fourth Congress, S. Rep. 646, p. 2.

ment of a drug or device is to be deemed false if it is false or misleading in any particular relevant to the purposes of the act regarding such drug or device, except that no representation concerning any effect of a drug or device is to be deemed false if it is supported by demonstrable scientific facts, or substantial and reliable scientific opinion, or substantial and reliable medical opinion. A representation that finds support from any one of these sources is not to be deemed false, no matter how thoroughly it may be discredited by evidence from the two other sources named in the bill. Scientific opinion is to be limited to the opinions of pharmacologists, physiologists and toxicologists. Medical opinion is to include the opinions not only of doctors of medicine and of dentistry, pharmacists, and nurses and licensed chiropodists but also of osteopaths, chiropractors, naturopaths, optometrists, midwives and possibly others concerning any drug or device that lies within the field of practice that the witness is authorized by law to pursue. The scientific opinion and the medical opinion sufficient to support any representation and save it from being legally false is not the preponderance of scientific opinion or medical opinion throughout the United States or even within any one state but is, in any state or territory nothing more than the opinion of any "numerically significant group" within that particular state or territory.

Tracing our way back, then, through the maze of definition and subdefinition embodied in the Copeland bill, we find that, no matter how effectively a representation concerning the effect of a drug or device is disproved by scientific facts and opinions, such disproof will not prevent the use of that representation in advertising and labeling, for the exploitation of that drug or device when it is sold in interstate and foreign commerce in any state, the District of Columbia or any territory, in which the misrepresentation is supported by the opinions of any "numerically significant group" of "practitioners of any branch of the medical profession," be they doctors of medicine, dentists, pharmacists, midwives, physiotherapists, optometrists or osteopaths, within their respective fields of licensed activity. So-called medical opinion, as it varies from time to time and from place to place in our fifty-four states, territories and other primary jurisdictions, is to determine what constitutes "misrepresentation"; and the manufacturer, distributor, dealer and consumer, and even the prescribing physician, must discover what that opinion is from day to day as best he can, at his own peril. But so long as a drug or device has the approval of any proper numerically significant group in a jurisdiction, it can lawfully be sold in that jurisdiction, in interstate commerce, no matter what the opinions of other equally or even more significant groups in the same community and throughout the world may think.

Misbranding That Injures or Kills Only by Delaying Treatment Is to Be Tolerated.—The insufficiency of the standards proposed by the Copeland bill with respect to the labeling and advertising of drugs and devices is aggravated by the following provision in the bill:

> Sec. 402. A drug or device shall be deemed to be misbranded—
> . . .
> (*b*) If it is dangerous to health *under the conditions of use prescribed in the labeling or advertising thereof.*

It must be rare, indeed, that a manufacturer, distributor or vender of quack medicines and devices cannot phrase the directions for use that he inserts in his labeling and advertisements so as to prevent his nostrum or device from being directly and positively "dangerous to health under the conditions of use prescribed in the labeling or advertising." With negative danger, as we shall see, injuring and killing by delaying proper treatment, the foregoing provisions of the Copeland bill are apparently not concerned.

Some protection is afforded by the requirement that, if a medicine contain any one or more of certain named habit forming drugs, the label shall declare that the medicine "May be habit forming." As an additional safeguard the bill proposes to require that the name of each active ingredient of a medicine, although not the proportions of each of the ingredients, be stated on the label. It proposes to require also that the labeling of any drug or device contain complete and adequate directions for use and adequate warnings against (1) use in particular conditions, (2) use by children, and (3) excessive or prolonged use and unsafe methods or dosage. But no such warning and information need be embodied in any advertisement.

On the other hand, the bill proposes to forbid the incorporation, in any advertisement of any drug or device, of representations as to its therapeutic effect in the treatment of Bright's disease, cancer, tuberculosis, infantile paralysis, venereal diseases, and heart and vascular diseases, but apparently representations of such therapeutic claims may be freely made in the labeling, if supported in the manner already described. Even the prohibition of the publication of therapeutic claims in advertisements does not apply in the case of the retail dealer who disseminates "in good faith" any advertisement, no matter how false it may be, offering for sale at his place of business any article that he does not distribute or sell in interstate commerce.

The language of the Copeland bill, set forth in the foregoing, has been given a most unhappy, unfortunate and unexpected meaning by the Senate Committee on Commerce. Unfortunately, the construction that the committee placed on the bill was made in such a way as to render it possible for it to be consulted and relied on by the courts, if doubt is thrown on the intent of Congress with respect to these particular provisions of the bill. The bill proposes, as has been pointed out, penalties for the introduction into interstate commerce of any misbranded drug or device, for the misbranding of any such drug or device in interstate commerce and for the receipt in interstate commerce of any drug or device so misbranded, and it provides for the seizure of any such misbranded drug or device. According to the Senate Committee on Commerce, however, these provisions of the bill are not to be construed to prevent such misbranding of drugs and devices as are calculated to injure and kill only by causing delay in the adoption of rational methods of treatment. Neither the bill nor the report of the Senate Committee on Commerce that accompanied it, May 22, 1935,[5] gave any clue of this limitation on the meaning of the language quoted. On May 28, 1935, however, the chairman of the Committee on Commerce, Senator Copeland, asked and obtained the unanimous consent of the Senate to amend the report of the committee as previously filed and printed, by inserting the following:

> *Much criticism has been launched at this provision on the ground that it applies to innocuous drugs for which extravagant therapeutic claims are made and which thus indirectly impair the patient's chance of recovery through his postponement of*

5. Seventy-Fourth Congress, S. Rep. 646.

proper methods of treatment. The language does not relate to such products. It applies only to potent drugs which are per se harmful unless properly administered.[6]

In order that there might be no possibility of misunderstanding regarding the matter, the report of the committee was at the same time amended by striking from the following paragraph in the original committee report the language reproduced in italics:

It is intended that the Government shall have authority to proceed with multiple seizures against any adulterated product. It is likewise intended that the Government may make multiple seizures of any misbranded product, whether it is per se poisonous or not, if it is misbranded in such a fashion that imminent danger to the health of the consumer is involved. *Such danger might result from improper or insufficient directions for use of a potent drug; it may also follow the misbranding of an innocuous drug with false claims for a serious disease, which induce the patient to delay effective treatment until too late. In the latter example, the product of itself, if honestly sold, would not in any way endanger health but, even though it is innocuous, it may very definitely endanger health through misrepresentations made for it.*

The amending of the report of the Senate Committee on Commerce in the manner stated, with the full knowledge of the Senate itself, may not unreasonably be construed by the courts as indicating an intent on the part of the Senate that, except so far as the bill proposes to forbid advertisements for the treatment of certain named diseases, it shall not interfere with the labeling and advertising of "patent" and proprietary medicines and devices that are misleading as to the effects of such medicines and devices, so long as they do not harm directly but aggravate disease and injury and hasten death only by leading the patient to refrain too long from seeking proper treatment. In other words, labeling and advertising that recommends the use of a drug or device not inherently dangerous, for the relief of cough, with lassitude and diminishing weight, is not to be forbidden, even though its use may delay diagnosis and rational treatment and end in death from tuberculosis. A drug, not in itself inherently dangerous, may, under the provisions of this bill as construed by the Senate committee, be lawfully labeled and advertised for the scattering of "lumps in the breast," although by its use diagnosis and rational treatment are delayed and the patient dies of cancer when an early operation would have saved her life.

Pharmacopeial and Formulary Standards Optional and of Doubtful Validity.—If the provisions of the Copeland bill are unsatisfactory so far as they relate to drugs and devices generally, those that relate specifically to drugs of what may be termed official types, such as those covered by the United States Pharmacopeia and the National Formulary, are no better. Those provisions are based primarily on the proposed statutory definition of the term "official compendium." The bill defines that term as follows:

Section 201. As used in this Act, unless the context otherwise indicates . . .
(*m*) The term "official compendium" means the United States Pharmacopoeia, Homeopathic Pharmacopoeia of the United States, National Formulary, or any supplement to any of them, official at the time any drug to which the provisions thereof relate is introduced into interstate commerce.

This proposed definition, if adopted, will introduce two standards for drugs not now recognized by law, namely, (1) the Homeopathic Pharmacopeia of the United States and (2) "supplements" to the United States Pharmacopeia, the Homeopathic Pharmacopeia of the United States and the National Formulary.

So far as is known, the fact that the Food and Drugs Act of 1906, for the past thirty years, has not officially recognized the Homeopathic Pharmacopeia has caused no trouble. No edition of that pharmacopeia has been published since 1914. What motivates the proposed recognition now of such an archaic volume it is impossible to understand. The situation is not improved by the provision that an agency, not named in the bill, but easily identified as the American Institute of Homeopathy, is to be authorized to publish from time to time "supplements" to this pharmacopeia.

After having defined the term "official compendium," the bill proceeds to establish standards for official drugs:

Section 401. A drug shall be deemed to be adulterated . . .
(*b*) If its name is recognized in an official compendium, or if it purports to be a drug the name of which is so recognized, and it differs from the standard of strength, quality, or purity as determined by the tests or methods of assay set forth therein; except that whenever tests or methods of assay have not been prescribed therein, or such tests or methods of assay as are prescribed are insufficient, for determining whether or not such drug complies with such standard, the Secretary is hereby authorized to bring such fact to the attention of the *appropriate body charged with the revision of such compendium* and if such body fails within a reasonable time to prescribe tests or methods of assay which are sufficient, then the Secretary may prescribe for the purposes of this Act such tests or methods of assay by regulations as provided by sections 701 and 703. *No drug shall be deemed to be adulterated under this paragraph because it differs from the standards of strength, quality, or purity therefor set forth in an official compendium, if its standard or* [*sic*] *strength, quality, and purity be plainly stated on its label.* . . .

This attempt at the establishment of drug standards gives rise to two questions: 1. Has Congress the right to delegate to unnamed publishers of the volumes that it designates as "official compendiums," and to unnamed publishers of "supplements" to such volumes, the right to fix legal standards for drugs, binding on every one throughout the United States? 2. Of what legal effect are the standards proposed by the bill, since every one is to be at liberty to adopt any standards of strength, quality and purity for any drug named in the pharmacopeia or formulary, provided only that he states his private standards on the label?

Attempted Delegation of Legislative Authority.—Has Congress the right to delegate to unnamed publishers of the volumes that it designates as "official compendiums," and to unnamed publishers of "supplements" of such volumes, the right to fix legal standards for drugs, binding on every one throughout the United States? One of the so-called compendiums the standards of which, present and future, it is proposed to adopt as legal standards, is the United States Pharmacopeia. It is published by a private corporation, the United States Pharmacopoeial Convention, Inc. Another, the Homeopathic Pharmacopoeia of the United States, is published by another private organization, the American Institute of Homeopathy. The third, the National Formulary, is published by a private organization, the American Pharmaceutical Association. Nowhere in the bill does the name of any of these organizations appear. They are referred to severally only as "the appropriate body charged with the revision of such compendium," but the bill nowhere charges anybody with any such duty. The bill imposes no limit on the right of the publishers of these compendiums to make and alter standards at pleasure, except that the Secretary of Agriculture may prescribe tests or methods of assay and packaging, if

6. Congressional Record **79**: 8645 (May 28) 1935.

after due notice the publishers fail to correct what he believes are defects in the tests or methods of assay and packaging previously prescribed by them. The bill lays down no lines of separation between the jurisdictions of these three organizations. It imposes on none of them any obligation to give notice of the proposed establishment of standards or of changes in existing standards, or to give hearings, or to publish in any prescribed manner or at all the standards prescribed.

The legal aspects of such an attempted delegation of ill defined legislative authority to unidentified agencies can hardly be discussed here, but such a delegation is believed to be clearly unconstitutional. The fact that the Food and Drugs Act of June 30, 1906, as amended, contains a similar provision, does not justify its incorporation in the Copeland bill. So far as is known, no serious attack on the standards in the present law has ever been made, but where attacks have been made on similar provisions in state food and drug acts, the courts have held, except in one instance, that the standards proposed in the state act in question were only those previously prescribed in the United States Pharmacopeia or the National Formulary and official at the time the act was passed. That a legislative body can lawfully incorporate in law standards in existence when the law is enacted is clear but that it cannot distribute among three unnamed private agencies an unrestricted authority to fix future standards, without the necessity of notice of hearing, or even publication, seems equally clear.

Of what legal effect are the standards proposed by the bill, since every one is to be at liberty to adopt any standard of strength, quality and purity for any drug named in the pharmacopeia or formulary, provided only that he states his private standards on the label? Possibly for the purpose of preventing a legal attack on the constitutionality of the privately made standards for drugs, proposed by the Copeland bill, the bill specifically provides that no body need comply with them, saying:

> No drug shall be deemed to be adulterated under this paragraph because it differs from the standards of strength, quality, or purity therefor set forth in an official compendium, if its standard or [sic] strength, quality, and purity be plainly stated on its label. . . .

The foregoing provision, authorizing all manner of variations from what at first glance appear to be official standards, is intended, it has been suggested, to preserve the constitutionality of the attempted delegation of legislative authority. If it seems to accomplish that end, it probably does so only because it makes it worth no one's while to test the issue in court. Probably the existence of a similar exempting clause in the Food and Drugs Act of 1906 is a reason why the constitutionality of the delegation of legislative authority attempted in that act has never been tested in court.

It has been urged that too rigid standards for drugs would retard progress and that an exempting clause such as is here proposed is necessary to permit advances to be made. This argument seems to lose sight of the fact that, if the provisions of this bill are valid, there will always be three organizations that can give immediate effect to any improvement in drugs, without any formality whatever, by the simple process of issuing a "supplement" to any one of the so-called official compendiums. As the bill is written, it proposes to make every pharmacist in the United States, wholesale and retail, the sole judge, so far as his own products are concerned, of what constitutes an improvement or advance in pharmacologic and therapeutic technic. Finally, although the drug standards in this bill, relating to such drugs as are covered by the pharmacopeias and formulary, will probably be declared unconstitutional as soon as the issue is raised, the bill makes no provision whatever whereby adequate standards may be set up by some duly constituted authority if such a situation should arise.

Labeling Requirements for Drugs Illogical and Inadequate.—While the Copeland bill proposes no adequate standards for purity and potency of drugs, it prescribes requirements for labeling that in some cases are unnecessary and in others may do harm rather than good. The Food and Drugs Act of 1906 provides that drugs shall be deemed misbranded if the package fails to bear a statement on the label of the quantity or proportion of any alcohol, morphine, opium, cocaine, heroine, alpha or beta eucaine, chloroform, cannabis indica, chloral hydrate, or acetanilid, or any derivative or preparation of any of them (section 8, subsection "In case of drugs," paragraph second.) The Copeland bill requires no such disclosure. It provides that if a drug is fabricated from two or more ingredients, the name of each active ingredient, including alcohol, shall appear on the label, unless the Secretary of Agriculture deems it impracticable, but it does not require that the quantity or proportion of the several drugs be stated. Obviously, the listing of the name of a potent, dangerous drug along with the name or names of one or more relatively innocuous drugs would give the purchaser no idea of the potency of the mixture. Innocuous drugs, under this bill, would probably be introduced into quack medicines for the sole purpose of using their names on the label to obscure the presence and effect of really potent drugs, like acetanilid or the barbituric acid compounds. The bill does contain a lengthy list of drugs the presence of which makes necessary a statement on the label that the drug or mixture "May be habit forming," but acetanilid and alcohol are not among the drugs so listed.

The general labeling requirements for drugs make no exception in favor of physicians' prescriptions, except that they authorize the omission of the warning phrase "May be habit forming." Even though adequate directions for use appear on the label, a physician's prescription, if it calls for a drug not designated solely by a name recognized in a so-called official compendium, must be labeled so as to show the common or usual name of the drug, if there is any, and, unless the Secretary of Agriculture by special dispensation otherwise provides, if the prescription calls for two or more ingredients, the label must show the name of each active ingredient, including any alcohol it may contain. A container in which a pharmacist has dispensed a physician's prescription or any other drug whatever—even so innocent a drug as sodium bicarbonate—must be labeled so as to give "warnings in such manner and form as may be adequate against use in such pathological conditions or by children where its use may be dangerous to health, or against unsafe dosage or methods or duration of administration or application" and, unless the secretary deems directions for use unnecessary for the protection of the public health, the label must contain also complete and adequate directions for use. Whether the required directions for use are to be "complete and adequate" for the purposes of the immediate purchaser of the drug, or "complete and adequate" for all purposes for which the drug may possibly be put, the bill does not say. Apparently, if the Copeland bill should be enacted in its present form, a new and elaborate system of labeling all manner of drugs will be set up.

PROMULGATION OF REGULATIONS

The Food and Drugs Act of 1906 provides for the promulgation of regulations by a board consisting of the Secretary of the Treasury, the Secretary of Commerce and the Secretary of Agriculture (section 3). These three officers, through the resources of their respective departments, have access to all information necessary for the framing of such regulations as the act requires. The Secretary of the Treasury, through the Bureau of Public Health Service, is in touch with matters relating to public health, and the Bureau of Customs keeps him in touch with foreign trade. The Secretary of Commerce, through the Bureau of Standards, has access to the best and latest scientific information regarding standards and methods of assay, and the Bureau of Foreign and Domestic Commerce and the Bureau of Fisheries serve to keep him in touch with problems relating to manufacture and industry and with one aspect of food production. The Secretary of Agriculture has in his jurisdiction the Bureau of Animal Industry, the Bureau of Dairy Industry, the Food and Drug Administration, and other agencies concerned with production and distribution of food and drugs.

The Copeland bill, however, proposes to break down this admirably organized board for the promulgation of regulations by eliminating from it the Secretary of the Treasury and the Secretary of Commerce. The bill proposes to set up, it is true, a committee on food standards and a committee on public health, appointed by the President, to assist in the promulgation of regulations. Without questioning the advisability of setting up a committee on food standards, it may well be pointed out that such a committee can cooperate just as effectively with such a board as now exists for the promulgation of regulations as it can with the Secretary of Agriculture alone. It must be frankly stated, however, that there seems to be no reasonable good to be obtained by the establishment of the proposed committee on public health, in the Department of Agriculture, independent of the recognized public health agency of the country, the United States Public Health Service, particularly at a time when the President has only recently felt called on to appoint a committee for the purpose of better coordinating and making more effective the health agencies that now exist.

ENFORCEMENT OF LAW

If the standards for drugs and the provisions with respect to the labeling and advertising of drugs and devices, laid down in the Copeland bill, are weak, that weakness is not likely to be offset by severity in the enforcement provisions of the bill. Probably in no other statute authorizing and providing for the punishment of crime has there ever been incorporated a provision specifically leaving to the discretion of the enforcing officer the determination whether he will or will not enforce the penalties that it provides, without any reference even to any "offer in compromise" or other quasipunitive adjustment. The Copeland bill, however, says that—

> Nothing in this Act shall be construed as requiring the Secretary to report for prosecution or for the institution of libel, injunction proceedings, or civil penalty action, minor violations of this Act whenever he believes that the purposes of the Act can best be accomplished by a suitable written notice or warning.

The standards by which the secretary is to determine whether a violation of the act is a "minor" or a "major" violation are not stated, nor is the secretary required to state them in regulations. Whether he will or will not institute prosecution in any case is left to his discretion in that very case, and he need give to no one his reasons for not prosecuting or make any record of those reasons. As the matter of instituting prosecutions or refraining from instituting them will not be passed on primarily by the Secretary of Agriculture himself but by subordinate officers in the Department of Agriculture, the danger of this provision is apparent.

The secretary must go through a long process, too, before venturing to initiate proceedings against any offender, except as relates to certain seizures that he is authorized to make. He must first serve or cause to be served on the supposed offender an appropriate notice and give to him an opportunity to be heard, and hearings must be conducted by the secretary of an officer or employee designated by him. Even after such a hearing and a tentative decision based on it, the secretary, before proceeding to prosecute, must report his tentative decision to the supposed offender and give him an opportunity to show cause why he should have a second hearing. Until after all this has been done, and until after a second hearing has been given, if the secretary believes that a second hearing is necessary, prosecution cannot be instituted.

The bill places a premium on a dealer's ignorance, when it provides that no dealer shall be liable to the fine and imprisonment prescribed by it, for having received in interstate commerce any article of food, drug, device or cosmetic and having "in good faith" sold it as received, unless he refuses to furnish on request the name and address of the person from whom he purchased or received such article and the documents pertaining to the delivery of the article to him. The dealer who remains ignorant of the quality of the goods that he sells and concerning the labeling and advertising of them can sell them "in good faith," even though they are in fact adulterated, misbranded and falsely advertised, and then avoid punishment by the simple expedient of furnishing, on request, the name of the person from whom he obtained such goods and the documents pertaining to their delivery. If a dealer takes the trouble to inform himself concerning the merchandise he handles, he will not be able lawfully to sell it. Furthermore, a dealer who is engaged in a retail business cannot lawfully be even prosecuted under this bill for the dissemination, "in good faith," of an advertisement offering for sale at his place of business any article which he does not distribute or sell in interstate commerce, although it is unlawful to disseminate similar advertisements in the mail, or in interstate commerce, by radio broadcast or otherwise, or by any means, for the purpose of inducing directly or indirectly the purchase of food, drugs, devices or cosmetics in interstate commerce.

Finally, it may be questioned whether the Copeland bill does not unduly restrict the dissemination of information by the Secretary of Agriculture concerning food, drugs, devices and cosmetics. The secretary must, it is true, cause to be published reports summarizing all judgments, decrees and court orders that have been rendered. Moreover, there is nothing to prevent the secretary from collecting, reporting and illustrating the results of investigations by the Department of Agriculture. The bill provides, however, that:

> The Secretary may also cause to be disseminated information regarding food, drugs, devices, or cosmetics *in cases involving imminent danger to health or gross deception of the consumer.*

Clearly, this implies that the secretary may not cause information to be disseminated regarding food, drugs,

devices or cosmetics, except so far as that information is derived from investigations by the Department of Agriculture, unless the danger to the health of the consumer is imminent or the deception of the consumer gross.

On the whole, the Copeland food, drugs, devices and cosmetics bill is disappointing in its weakness. It has much in it to be commended, but the medical profession should lend its influence to bring about a rewriting of at least so much of the bill as relates to drugs and prophylactic and therapeutic devices, and possibly of other features. It is important that this be done not only because of the immediate effect of the enactment of the Copeland bill but also because that bill, if enacted, is likely to be adopted as a pattern for state legislation within the next few years, both its weaknesses and its strength. It is hoped, therefore, that through the efforts of the profession and of other agencies interested primarily in the welfare of the consumer, the hands of the Secretary of Agriculture will be strengthened and the health and pocketbooks of the people will be protected by an adequate reenforcement of the pending measure.

Therapeutics

THE THERAPEUTICS OF THE COOK COUNTY HOSPITAL

EDITED BY BERNARD FANTUS, M.D.
CHICAGO

NOTE.—*In their elaboration, these articles are submitted to the members of the attending staff of the Cook County Hospital by the director of therapeutics, Dr. Bernard Fantus. The views expressed by various members are incorporated in the final draft for publication. The articles will be continued from time to time in these columns. When completed, the series will be published in book form.*—ED.

THE CAUSAL THERAPY OF CONTACT DERMATITIS

IN COLLABORATION WITH DR. THEODORE CORNBLEET

Eruptions due to chemicals may be the result of the internal administration of drugs, a condition known as medicinal dermatosis, or of direct application of the irritant to the skin, a condition also known as dermatitis venenata and which we shall speak of as contact dermatitis.

DISCOVERY OF THE IRRITANT

A contact dermatitis may be merely the usual reaction to a generally harmful agent, one capable of damaging any skin, or it may be due to an allergen, in the unusual reaction to which the altered reactivity (allergy) of the organism is of prime importance.

While it is usually not difficult to recognize the causal nexus between a generally harmful chemical agent and a resulting dermatitis, it is often hard to discover the allergen responsible for an allergic dermatitis; and obviously this is the most important step in the therapy.

The following method of study of a case is helpful in establishing a diagnosis of contact dermatitis and in detecting the agent responsible for it:

(*a*) *Distribution of the Lesions.*—An eruption on those exposed parts which have the greatest opportunity for contact with an irritant speaks in favor of a contact dermatitis. Nevertheless, covered parts may be involved, as when there is hypersensitiveness to articles of clothing or to cleansing agents remaining in the clothing, or when transference or dissemination of the irritant occurs. An example of such transference is to be seen in the localization of poison ivy dermatitis on the genitalia. Eruptions produced by internal causes are usually bilateral and often symmetrical.

(*b*) *The Morphology of the Lesions.*—This may help in differentiation between a contact dermatitis and a medicinal dermatosis, in that the former is a simple dermatitis, often of vesicular nature, while the latter takes nearly every possible form except that of simple dermatitis.

(*c*) *The History.*—To find the irritant or irritants responsible for the patient's dermatitis, a clear history of the patient's work, activities and environment is most important. The frequency with which the causal irritant is brought to light depends largely on the diligence and insight of the inquirer. A knowledge of the common irritants used in the various trades and vocations is of material aid. A list of probable or possible skin irritants that the patient is exposed to should be drawn up and the patient tested with these.

(*d*) *Materials for Reaction.*—Almost anything at all may cause a contact dermatitis. Certain substances, however, are more prone than others to produce it. Such agents are most likely to be found among substances having a marked chemical affinity for the skin; thus, keratolytics and detergents and chemicals that have a great affinity for the horny layer of the skin, such as trinitrophenol (picric acid) or paraphenylenediamine (the black dye used for dyeing furs and shoes) or certain metallic salts, as the mercurials, and bodies that are more soluble in fat than in water, such as plant oils and certain alkaloids.

In addition to poison ivy there are many instances of summer dermatitis caused by contact with the leaf or wind borne pollen of other plants, particularly members of the ragweed family. These individuals are apparently sensitive to the lipoid fraction of the plant and not to the protein portion. They usually do not have hay fever. In the literature there are several comprehensive lists of common irritants. The safest procedure is to take a careful history and ascertain those things to be suspected which are present in the patient's environment. These materials should first be tested and then others which are known commonly to produce sensitization may be added to them. It takes experience with the method to ferret out the less obvious irritants. But diligence here has its rewards. If the hypersensitivity is monovalent, the discovery of the irritant and its withdrawal will almost always give dramatic results. The dermatitis will improve promptly and spontaneously.

(*e*) *The Patch Test.*—Squares of linen or cotton material about the size of a postage stamp, dipped in or moistened with the test substance in as nearly possible the concentration with which the patient comes in contact with it, are placed on the skin. If the substance is a solid, it should be dissolved in its suitable solvent: water, oil or alcohol. If the test material is an insoluble powder, it is moistened and placed on the skin and covered with the squares of linen. Leaves of plants should be as fresh as possible. A piece of impermeable material, such as cellophane, about four times as large, is put over the test squares and a

"frame" of adhesive plaster anchors all this to the skin. The transparent material is purposely made so much larger to permit differentiation, as nearly as possible, from irritation due to the adhesive plaster. If a few materials are under test, the flexor surface of the arms and forearms may be used. If a large number of substances must be tested, the back is a more convenient site. By arranging the patches in rows, as many as twenty tests may be made here at one time. The patches are left in place for twenty-four hours and then removed, unless the reaction due to their presence is so great and so uncomfortable that they must be removed sooner. Reactions are looked for at the time when the patches are removed and after forty-eight and seventy-two hours from the time of initial contact. Sometimes reactions may be delayed even for several days. Obviously a control patch should always be employed. If the patient is allergic to adhesive plaster, collodion may have to be employed to fasten the patch to the skin.

Interpretation.—A positive reaction is denoted by the appearance on the tested area of an eczematous reaction. In other words, the reaction should resemble in appearance the dermatitis clinically present. Care should be taken not to confuse true reactions with pseudo-reactions such as those from adhesive plaster.

False Negative Reaction: If a positive reaction of the type clinically present should appear whenever a certain substance is used in a test, interpretations would indeed be easy. Unfortunately, reactions do not always appear, even if the patient is sensitized to the test substance. A negative reaction may result because the patient is temporarily desensitized by an acute reaction he has just had or because he has remained away from the excitant for some prolonged period of time. The sensitization may be localized, i. e., present in isolated areas, such as on the eyelids or even one eyelid—to eyelash dyes, while other skin areas may be insensitive to this eyelash dye and thus fail to react to it. The V of the neck may be a suitable area for patch tests with substances irritating the face. Sometimes a reaction depends on multiple influences that individually may not suffice to set up a dermatitis. An example of this is seen in the type of dermatitis that may follow exposure to the sun's rays after contact with certain grasses and shrubs.

In some cases, apparently, it is the interplay of heat and sweat, in addition to a specific sensitizing substance, that produces the dermatitis. At times it may be necessary to traumatize the skin somewhat, as by slight multiple scratches on the epidermis, in order to get the proper base for a positive reaction. Failure to appreciate these multiple factors may result in overlooking the cause. The reaction to a specific substance may depend on some other underlying sensitizing state. If this primary condition is removed, it will prevent the test substance from giving the positive reaction it should. An example of this is the dermatitis from leather or other substances when an eczematoid ringworm is present at the same time. When the eczematoid ringworm is cleared up, the individual fails to react to the leather or other substances. With the recurrence of the eczematoid ringworm, the subject again reacts to these excitants and they will then give a positive patch test.

The patch test is not of practical use in chronic lichenified eczema or disseminated neurodermitis, seborrheic dermatitis, urticaria, angioneurotic edema or drug eruptions not of an eczematous character. In recent years dermatologists have come to recognize the complex character of the skin's immunity reactions. It is now known that the skin does not act as a unit throughout its thickness in responding to irritants, but rather through its several components. Each of these has the capacity to react independently with only indirect changes occuring in the rest of the skin. External irritants generally, but not always, affect the outer or epithelial portion, while constitutional or circulating materials in the blood or lymph usually act on the blood vessels, the corium or the subcutaneous layers. An allergic reaction takes place only when an allergen comes in contact with the sensitized tissue. If the deeper parts of the skin are sensitized as in urticaria (q. v.) the material under test must be injected into the skin or be introduced by scratching away the overlying epithelium, or even ingested to produce the reaction. On the other hand, if the epithelium itself is sensitized, injecting the material under test into the skin or by scratching the epithelium is apt to give a false negative reaction. As, on the other hand, the patch test may give a positive reaction also, with material, e. g., quinine to which the patient is hypersensitive on ingestion, the patch test should be the first one to be performed in the study of allergic dermatoses.

In noneczematous, presumably allergic, dermatoses, this test, if negative, should be followed by endermic and/or ingestion tests (see Urticaria).

False Positive Reaction.—A positive patch test does not always mean that the material used to obtain it is the cause of the patient's dermatitis. The dermatitis that the patch test produces should be similar to that present clinically. The material used for the test should be shown to be present as a possibility in the patient's work or surroundings. There must then be an opportunity for contact, as brought out in the history. An individual that becomes sensitive to one substance often develops a sensitivity to others. These may be numerous. The positive patch test therefore may bring to light one of the substances the patient is sensitive to, but not necessarily the one responsible for the clinical condition present. To check up on this, the dermatitis clinically present must be shown to disappear after the material used for the positive patch test is withdrawn from the patient's work or surroundings. It may be necessary for the patient to come in repeated contact with the substance to develop a dermatitis from it. A negative patch test from a single application may in such a case yield a false result. For all these various reasons and others it takes exceeding care and watchfulness to evaluate properly the results of the patch test. It is, of course, necessary that in testing for skin allergy normally harmless concentrations of the test material be employed. Thus, soap will give a positive patch test on the skin of a normal person. For testing, an emulsion of soap must be made that is sufficiently dilute not to irritate normal skin.

PREVENTION OF EXPOSURE TO THE IRRITANT

Elimination of the substance or the substances that give positive skin tests helps in the cure of the skin disease and prevents its recurrence.

In occupational contact dermatitis it is not always necessary for the patient to give up his employment. The use of rubber gloves, for instance, may protect him

sufficiently. The accompanying formula is offered (James, 1934) as a protective film for persons susceptible to paints or varnishes with which they must work. This produces an invisible covering, soluble in water, nonirritating to the normal skin. The only difficulty with the preparation is that its water solubility makes it impossible to keep it on the skin when the skin perspires during hot weather.

In cases of obvious or suspected contact dermatitis in which the irritant cannot be discovered, removing the patient from his home and work may lead to a prompt recovery. If the condition reappears on return to the patient's accustomed surroundings, a painstaking analysis of the materials to which he is exposed and the patch test may lead to the ultimate discovery of the etiologic agent. Indeed, this "climatotherapeutic test" is useful for the discovery not only of a chemical but also of psychic as well as physical pathogens in a patient's accustomed surroundings.

Protective Film

	Per Cent
Ivory soap flakes	7.48
Glycerin, chemically pure	26.40
Sodium silicate	24.20
Tragacanth	0.21
Oil of lemon	0.16
Water	41.60

REMOVAL OF PREDISPOSING CAUSE

Removal of the predisposing cause is chiefly a matter of lessening excessive perspiration and mechanical irritation. Persons who perspire freely are more apt to develop sensitization to external irritants. Excessive sweating is usually an evidence of weakness and it often has a background of overwork and exhaustion. These patients require some form of rest cure, mental, physical or both. If the patient is worn out by lack of sleep, he may need his insomnia (q. v.) taken care of. Obesity or anemia favor excessive perspiration and the treatment (q. v.) of these becomes of importance in this connection.

DESENSITIZATION

Desensitization is generally unsuccessful in contact dermatitis for the reason that simple chemical irritants, even when they become allergens, do not produce circulating antibodies. This is in marked contradistinction to such complex antibodies as food proteins and bacteria, which are capable of acting as antigens, producing antibodies. In general antigens are chemically akin to the assimilable foods.

In cases in which an antigen, i. e., a substance capable of producing the development of antibodies, is a cause of contact dermatitis, an attempt may be made at desensitization by injecting, for the purpose of immunization, ascending doses of the antigen secured in as pure a form as possible and prepared in the form of sterile highly dilute solution. An example of this method is found in the therapy of ivy poisoning (q. v.). Desensitization treatment in the case of other types of plant dermatitis has been frequently successful.

SYMPTOMATIC TREATMENT

Whether the cause of a dermatitis can be discovered or not, symptomatic relief is demanded. The details of this are given in connection with the therapy of eczema (q. v.).

As individuals may be allergic even to the ointment bases employed in treatment, the patch test should be employed to discover such hypersensitiveness when its possibility is suspected.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ARTICLE. HOWARD A. CARTER, Secretary.

RADIOTHERAPY

(ROENTGEN RAYS; RADIUM)

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BIOLOGIC CONSIDERATIONS

Each variety of cell in the body is specifically sensitive to roentgen rays or radium. Certain varieties of cells are extremely sensitive and are destroyed or injured by small doses; other varieties are resistant and can tolerate large doses with apparent impunity. This does not imply that a given dose of roentgen rays will destroy all cells of a given variety in the irradiated territory, because the sensitiveness of any kind of cell varies somewhat from cell to cell. It would be more accurate to say, therefore, that each variety of cell has a specific range of sensitiveness.

When cells of a given kind are exposed to a certain dose of radiation, some are destroyed, some are injured but regenerate later, and some do not show any deleterious effect. Such variation in the susceptibility of different cells of the same kind is probably due to the metabolic stage of the cells and perhaps to other unknown factors. Whatever the main reason for variation in the radiosensitiveness of different cells of the same variety may be, this does not affect the fundamental law of the specific sensitiveness of different varieties of cells, a law based on innumerable experiments on animals and substantiated by extensive clinical observation.

According to present knowledge, cells may be classified, in the order of the degree of their sensitiveness, as follows:

Lymphoid cells (lymphocytes in the spleen, lymph nodes, intestinal lymph follicles, circulating blood, bone marrow, thymus, tonsil, and other structures in which such cells may be present).

Polymorphonuclear leukocytes and eosinophils in the blood or tissues.

Epithelial cells: (1) basal epithelium of certain secretory glands, especially the salivary glands; (2) basal epithelium (spermatogonial cells) of the testis and follicular epithelium of the ovary; (3) basal epithelium of the skin, mucous membranes and certain organs, such as the stomach and small intestine; (4) alveolar epithelium of the lungs and epithelium of bile ducts (liver) and (5) epithelium of tubules of the kidneys.

Endothelial cells of blood vessels, pleura and peritoneum.

Connective tissue cells.

Muscle cells.

Bone cells.

Fat cells.

Nerve cells.

Although the difference in susceptibility between the most sensitive and the least sensitive varieties of cells is considerable, no cell in the body is wholly invulnerable to radiation; all cells, whatever their variety, may be destroyed or injured if exposed to a sufficiently large dose of rays, especially if doses within the therapeutic range are disregarded. It is possible that the apparent difference in radiosensitiveness between certain kinds

of cells, such as between the epithelium of the skin and that lining the bile ducts of the liver, may be chiefly due to the distance between them and the focus of the tube; but the mere factor of distance from the source of radiation (roentgen tube) does not appear sufficient to explain such differences. How, for instance, could the relatively greater sensitiveness of the epithelium of the small than of the large intestine be accounted for? Such difference can be explained only by histophysiologic factors within each structure. Bergonié, Tribondeau and others have shown conclusively that the younger and the more active the cell, from an metabolic point of view, the more susceptible it is to the influence of the rays. Cells that naturally undergo rapid mitotic division and the life cycle of which, therefore, is comparatively short are most radiosensitive. But the relation of the age of the cell to its relative sensitiveness is less important than the specific vulnerability of the different varieties of cells.

LYMPHOID CELLS

The exceptional sensitiveness of lymphocytes was established by the early experiments of Heineke and has since been fully confirmed by Warthin, Krause and Ziegler, Fromme, Jolly, Tsuzuki, Piepenborn and many others. When the entire body of an animal is exposed to roentgen rays, the spleen, the mesenteric and other lymph nodes, the intestinal lymph follicles, the blood and bone marrow, the thymus in young animals, and other collections of lymphoid tissue show a more or less marked destruction of lymphocytes, and the degree of such destruction is in proportion to the dose of rays and to the interval between irradiation and death. As the number of intact lymphocytes in the spleen and lymph nodes diminishes, the stroma becomes more prominent, and this feature may become so pronounced that the malpighian corpuscles or lymphoid follicles may largely disappear and be recognizable only by the blood vessels and the concentric arrangement of the corpuscular or follicular stroma. Heineke found destruction of lymphocytes two hours after irradiation, but Warthin, who examined the lymphoid structures sooner after exposure to the rays, found unmistakable evidence of lymphocytic disintegration within fifteen minutes after irradiation.

The destruction of these cells is characterized by disorganization and fragmentation of the nuclear chromatin and by scattering of the fragments of chromatin between the remaining intact cells and in the spaces of the reticular stroma, where the fragments gather into clumps or balls. The extent and the duration of this destructive phase depend on the intensity of irradiation, may continue from one to several days, and are accompanied by a progressive reduction in volume or atrophy of the affected lymphoid structures. Then the clumps or balls of degenerate chromatin are gradually taken up by some of the reticular cells, which assume a phagocytic property and swell as the amount of ingested chromatin débris increases. Such phagocytic disposal of chromatin material from the destroyed cells may continue until the lymphocytes are largely destroyed, but a certain proportion of the cells appear to resist the action of the rays. Some hours later, the phagocytic reticular cells themselves begin to disappear; the chromatin débris ingested by the phagocytes apparently undergoes intracellular digestion, because the number and size of the ingested fragments diminish steadily. From seven days to three weeks after irradiation, more or less regeneration of lymphoid tissue may be observed.

POLYMORPHONUCLEAR AND EOSINOPHIL LEUKOCYTES

Next to the lymphocytes in sensitiveness to roentgen rays are the polymorphonuclear and eosinophil leukocytes in the circulating blood or in the tissue spaces of different organs. Two or three days after irradiation, degenerative changes in these cells also may occur, but their disintegration is less marked than that of the lymphocytes and is often preceded by a sharp increase in the number of polymorphonuclear cells in the circulation. It is not clear whether such polymorphonuclear leukocytosis is to be regarded as a compensatory or defense reaction or merely as a mobilization of cells to counteract the effect of the rays. In any event the increase in the polymorphonuclear cells, often observed during the first twenty-four hours after irradiation, is but a transient phase and is invariably followed by a varying degree of polynuclear and eosinophilic leukopenia. The extent of cellular destruction, the time at which these cells begin to regenerate, and the rate of regeneration are a measure of the dose of roentgen rays and of the cubic area of body exposed.

THYMUS GLAND

The essential character of the small round cells of the thymus gland has long been the subject of controversy. The extensive investigations of Hammar have led him to conclude that these cells are lymphocytes, and this conclusion is strongly supported by the reaction of these cells to irradiation. Rudberg, Aubertin, and Bordet, Arella, and especially Regaud and Crémieu have shown that the small round cells of the thymus react at the same rate and undergo the same changes as the lymphocytes of the spleen, lymph nodes, intestinal lymph follicles, bone marrow and circulating blood. When the thymic region of a young animal, such as a guinea-pig or a rabbit, is exposed to roentgen rays, the lobules of the thymus exhibit, within twenty-four hours, destruction of small round cells characterized by fragmentation of the chromatin of the nucleus and scattering of the fragments among the remaining intact cells. The degree of cellular disintegration varies with the dose of roentgen rays and may be so extensive as to give the lobules a depopulated appearance; the stroma and blood vessels of the lobules stand out prominently.

As the destruction of small round cells proceeds, some of the reticular cells ingest the scattered fragments of nuclear chromatin and swell in proportion to the amount of the material which they take up. The reticular phagocytes then migrate toward the corpuscles of Hassall and appose themselves to the peripheral cellular layer of the corpuscles. The degenerate chromatin residue from the destroyed lymphocytes then passes from the reticular phagocytes through the successive layers of cells of the corpuscles of Hassall and finally reaches the central clear space of the corpuscle, where the partly digested nuclear débris accumulates as an amorphous mass. As the number of reticular phagocytes accumulating around the periphery of the corpuscles increases, the corpuscles swell to many times their normal size. After all the nuclear débris has passed from the phagocytes to the cells of the corpuscles proper and has reached the central clear space, the corpuscles gradually diminish in size; some recover

their normal dimensions, but many become abnormally small and some disappear completely.

If the gland has been irradiated only once, some of the small round cells are not destroyed, although their mitotic activity is inhibited. After one or two weeks, such cells recover and appear to serve as a nucleus for regeneration, which proceeds more or less rapidly until the number of small round cells in the thymic lobules again approximates the normal. The phase of cellular destruction is accompanied by a corresponding decrease in size and weight of the gland, which recovers its normal dimensions and weight as the cells regenerate. Repeated irradiation, however, may cause destruction of all the lymphocytes, and this is accompanied by marked atrophy of the gland. In this event regeneration does not occur.

EPITHELIUM OF THE SALIVARY GLANDS

Next to the leukocytes in point of radiosensitiveness are the basal epithelial cells of the salivary glands. Actually these cells are more sensitive to radiation than the polymorphonuclear and eosinophilic leukocytes, as evidenced by the fact that, whereas microscopically perceptible changes in the last two varieties of cells can seldom be found within the first six hours after exposure to the rays, clinical signs of salivary reaction can usually be observed in from three to six hours after irradiation. These signs consist of swelling, redness and tenderness in the region of the irradiated glands and, when bilateral, may simulate the salivary phase of mumps. If all the glands on both sides have been exposed to the rays, the foregoing clinical signs may be rapidly followed by a decrease in salivary secretion, often leading to dryness of the mouth lasting from a few days to two or more weeks. Microscopically, this reaction of the salivary glands is characterized by mucinous degeneration of the basal epithelium. The amount of mucus in the secretion increases, and the cells may swell to such an extent that the meatus of the excretory ducts becomes occluded; hence the swelling and tenderness of the glands and the dryness of the mouth. After a single irradiation, such salivary reaction is always transient; after a time, usually from twenty-four to forty-eight hours, the acute phase of the reaction subsides and the clinical signs gradually abate. After repeated irradiation, however, the secretory function of the glands may cease and the dryness of the mouth may persist in some degree for a long time.

It must be clearly understood that these effects can occur only when all the salivary glands on both sides are exposed to the direct action of the rays. Such reaction does not occur when other parts of the body are irradiated, and exposure of the salivary glands on one side causes a reaction on that side only. When the reaction is unilateral, dryness of the mouth is seldom noticed, undoubtedly because the glands on the opposite side furnish sufficient saliva to lubricate the oral mucosa.

EPITHELIUM OF TESTIS AND OVARY

The Testis.—It has long been known that the testis is peculiarly sensitive to irradiation. It is not as sensitive, it is true, as some of the leukocytes or as the salivary glands, but, with the exception of these, it is the most sensitive structure in the body. Such susceptibility has been established by numerous experiments on animals as well as by the cessation of seminal function in radiologists and other persons exposed to roentgen rays over a long period of time. The cells of Sertoli are relatively resistant to irradiation, and this fact tends to support the view that they supply nourishment to the basal layer of true seminal cells, the spermatogonia. The radiosensitiveness of the testis is due to susceptibility of the spermatogonial cells, which are affected deleteriously even by a moderate dose of roentgen rays. The spermatocytes of the first and second order, as well as the spermatids and mature spermatozoa, are distinctly less sensitive than the spermatogonia and are affected only by larger doses. Even then much of the cellular degeneration noted is probably secondary to the direct action of the rays on the basal cells.

Microscopic examination of the seminal tubules some days after irradiation may disclose vacuolization and degeneration of some or all of the spermatogonia, depending on the dose of roentgen rays to which the organ has been exposed. After a sufficiently large dose, the degeneration of the spermatogonia proceeds to complete disintegration. This is accompanied by failure of the cells to evolve into spermatocytes and then to mature spermatozoa, and the final result may be a permanent azoospermia. After a dose insufficient to cause permanent azoospermia, a certain proportion of the spermatogonia may be able to survive and serve as a nucleus for histologic regeneration and functional restoration. Repeated large doses at comparatively short intervals are almost certain to induce permanent roentgen castration. The interstitial tissue, on the other hand, is much more resistant and is not perceptibly influenced by ordinary therapeutic irradiation. Needless to say, however, even the interstitial tissue could be irreparably injured by excessive irradiation beyond the therapeutic range.

The Ovary.—The radiosensitiveness of the ovary is essentially the same as that of the testis, and the cells to which the specific susceptibility of the gland is due are the ova and the epithelial cells of the follicles. The sensitiveness of different follicles varies according to the stage of their development, and the effect of irradiation may be the disintegration and disappearance of a certain proportion of the follicles or complete and permanent destruction of every follicular structure, depending on the dose of rays to which the ovary has been exposed or on the number of times a given dose has been repeated. Moreover, the steps in the reaction of the follicles are analogous to those of spontaneous physiologic atresia.

The follicular reaction appears from three to six hours after exposure and is particularly marked in the mature follicles. In the primary follicles the rays act on the ovum sooner than on the follicular epithelium, and such action is featured by pyknosis of the germinal vesicle, condensation of the protoplasm and finally chromatolysis and fragmentation of the cell. The cellular fragments then undergo phagocytosis by the follicular epithelial cells, which themselves degenerate as soon as the phagocytic disposal of the fragmented ova is complete. These different steps require three or four days; but, since all the follicles do not begin to react at the same time, a week or more may elapse before all the affected follicles have disappeared. A single irradiation within the range of therapeutic doses may not destroy all the follicles.

The same cycle of changes occurs in the more mature follicles with several layers of epithelium, but in these the follicular epithelium is much more sensitive and its cells undergo rapid autolysis. Moreover, the connective

tissue cells of the theca interna degenerate as rapidly as the epithelial cells. In the still more mature follicles, in which the ovum is large and separated from the follicular epithelium by a membrana pellucida, the epithelial cells first penetrate this membrane by diapedesis, dispose of the degenerate ova by phagocytosis, and in turn degenerate and disappear. Such migration of the epithelial cells begins about the third day, and the degenerative process continues for two or three weeks. Usually all such follicles are destroyed by irradiation, but on account of the large size of the ova the autolytic process may require considerable time.

In fully developed follicles the epithelial cells are still more radiosensitive, most of the parietal epithelium of the follicular cavity being destroyed by irradiation, whereas the epithelial cells which surround the ovum are slightly less sensitive. Sometimes irradiation may be followed by an accelerated maturation of the ovum, followed by degeneration. Thus the radiosensitiveness of the ovarian follicles increases in proportion to their development. Follicles in process of maturation are readily destroyed by exposure to roentgen rays, but a certain proportion of the primordial follicles may escape if the dose has been small.

The interstitial cells of the ovary do not appear to be influenced directly by the rays but gradually and slowly disappear, probably because the destruction and disappearance of the follicles prevents the interstitial cells from being renewed. The follicular degeneration that follows irradiation is accompanied by a corresponding atrophy and reduction in weight of the ovary.

EPITHELIUM OF THE SKIN AND MUCOUS MEMBRANES

The Skin.—The skin can tolerate with impunity a considerable single dose of roentgen rays, but when its limit of tolerance is exceeded it may undergo a series of reactive changes.

Early Effects: In the case of the scalp the first clinical manifestation of excessive irradiation from a physiologic but not from a therapeutic standpoint, is a readiness of the hair to fall out in the exposed territory. The hair can be plucked with unusual ease or may fall spontaneously. Such epilation occurs two or three weeks after irradiation and continues for a short time. After relatively small doses epilation is only temporary, but after sufficiently large doses the alopecia is permanent. In the case of the skin of the body as a whole (other than that of the scalp), following a single dose of roentgen rays or radium, erythema may occur without epilation, or epilation and erythema may occur more or less simultaneously. After a still larger dose not only does epilation occur but varying degrees of reactive inflammation of the skin may take place. Dermatitis may appear as a mere erythema lasting a few days, followed by slight pigmentation corresponding to the exposed area; as more pronounced, bright red erythema, with a sensation of heat, followed by the formation of vesicles and later by itching, exfoliation of the epidermis and deep pigmentation; or, in extreme cases, as intense, painful erythema, with or without fever, and followed by more or less extensive ulceration of the entire thickness of the skin. The mild grade of radiodermatitis usually does not leave permanent marks beyond slight atrophy of the irradiated area of skin, provided the inflammatory reaction resulted from a single exposure and was not preceded or followed by other exposures. If such a reaction should appear after the same area of skin has been exposed several times, it is likely to be followed, from one to three years later, by telangiectasis. Needless to say, the sudoriferous and sebaceous glands of the irradiated skin also undergo degenerative changes.

Radiodermatitis accompanied by the formation of vesicles is soon followed by more extensive desquamation or by the actual formation of small rounded or larger, irregular, cutaneous scars. When radiodermatitis is sufficiently severe to lead to ulceration, the ulcers are noted for their slow healing. This is due partly to the peculiar character of the cellular injury produced by irradiation and partly to the secondary infection which so commonly complicates the ulceration. The severe grades of radiodermatitis generally result from inexperience, from a miscalculation of some of the dosage factors, or from the accidental omission of a certain filter with a dose based on the use of filtered rays.

The rays act on the epithelium of the hair follicles. This explains the loosening or falling of the hair. As is well known, the elective sensitiveness of the hair follicles is made use of in the treatment of skin diseases, such as ringworm, in which the dose of roentgen rays is adjusted so as to cause temporary epilation. The success of the treatment rests on the ability of the radiologist to regulate the dose within narrow limits; any uncertainty in this respect may result in permanent alopecia or worse. When the dose is sufficient to cause distinct erythema, the microscopic changes include an irritative disturbance of the basal layer of cells accompanied by hyperemia and edema, and later by degeneration and desquamation of the epidermis. After still larger single doses, these cellular and circulatory alterations may be quite marked and may extend to all the layers of the skin.

The rays also act on the endothelium of the blood vessels, causing these cells, and sometimes the entire intima, to swell and to undergo hyperplasia and later connective tissue proliferation, which may lead to reduction in the caliber or actual obliteration of the vessels. This serves to explain in some measure the slow healing of radiodermatitic ulcers, an explanation further substantiated by the fact that a dose several times greater may be given to a very small area of skin (from 1.5 to 2 cm. or less) without causing ulceration.

Late Effects: Besides the foregoing acute effects of irradiation and their sequelae, there exist two varieties of late effects. One variety is featured by late necrosis in a region of the skin subjected, several months or even several years before, to repeated irradiation to the point of inducing early lesions, such as have been described. Such necrosis commonly follows slight trauma but may occur without any apparent, immediate cause. It begins with redness, pain, swelling and a sensation of heat, and a short time later a progressive ulceration similar to that which typifies early radiodermatitis of the third degree. It is probable that the chief determining cause of such late ulceration is infection of the connective tissue, the natural resistance of which has diminished as a result of obliterative changes in the blood vessels and other chronic changes in the connective tissue itself.

The second variety of late radiodermatitis is encountered in cases of physicians or others who may have been exposed to roentgen rays or radium at frequent intervals for a long period of time. It affects usually the hands and sometimes the face. The lesions appear

only after years of daily exposure and consist of a thickening of the skin, with redness and sensitiveness, and often also of a dryness and brittleness of the nails. In fact, changes in the nails often precede other evidences of injury. The skin becomes harsh and tends to crack easily, and areas of keratosis develop, which later may undergo epitheliomatous transformation. Many of the pioneers in roentgenology have had the misfortune to pay for their ignorance of the danger or for their carelessness, with the loss of fingers, hands or entire extremities, and a number have lost their lives.

MUCOUS MEMBRANES

The sensitiveness of the epithelium of mucous membranes is much the same as that of the skin. Excessive single irradiation causes first anesthesia, then dryness, redness from hyperemia, and edema. Depending on the doses, these clinical manifestations may abate and disappear or may be followed by ulceration. Excessive repeated exposure causes a hyperplastic thickening of the epithelium, and this may be followed by necrosis.

SPECIALIZED MUCOUS MEMBRANES

The Stomach and Intestine.—The radiosensitiveness of specialized mucous membranes, such as the mucosa of the stomach and intestine, varies with each structure. Irradiation of the stomach causes temporary reduction in the secretion of gastric juice, and this affects the production of hydrochloric acid and pepsin. If the stomach is exposed repeatedly at relatively short intervals, the gastric acidity and pepsin fall lower and lower. Such an effect may continue for several weeks or several months. If the exposures should be repeated indefinitely it is conceivable, if not indeed probable, that the secretory activity of the gastric mucosa would be completely and permanently destroyed. The susceptibility of the intestine varies in its different parts. The mucosa of the colon is relatively insensitive to the action of the rays; at least, it is much less sensitive than that of the small intestine. The most radiosensitive portion of the mucosa of the digestive tract is that of the duodenum and jejunum, in which irritative reactions may occur after doses insufficient to cause any disturbance in the overlying skin. When the upper half of the abdomen is exposed to a therapeutic dose of roentgen rays, anorexia, nausea and vomiting often follow within a few hours, and diarrhea may appear several days later. Exposure to excessive doses, such as have been employed in many experiments on animals, causes mucinous degeneration of the intestinal epithelium, hyperemia, and edema of the mucosa and submucosa, and such changes may be sufficiently marked to be followed by desquamation of the epithelium. According to the severity of the reaction, the epithelium may regenerate or the breach in the mucosa may be repaired by connective tissue.

EPITHELIUM OF THE LUNGS AND LIVER

The lungs are comparatively resistant to the action of roentgen rays, but if the overlying skin is exposed to a grossly excessive dose, especially if the thoracic wall is thin and if such a dose is repeated several times, reactive pneumonitis is likely to follow. This may subside spontaneously without any after-effects or may be followed by fibrous repair and more or less impairment of respiratory function.

As a whole, the liver is still less radiosensitive than the lungs. Most of the pathologic changes in the liver that have been found after experimental irradiation of animals have not been direct effects of the rays but an indirect effect of cellular changes in other more sensitive structures. The epithelium of the biliary ducts, however, appears to be slightly more sensitive than the hepatic cells themselves, but it is not clear whether the alterations that have been observed resulted from the direct action of the rays or whether they also were secondary to the circulation of toxic products of cellular degeneration in remote organs.

EPITHELIUM OF THE KIDNEYS

The kidneys can hardly be regarded as radiosensitive organs, as far as therapeutic doses of roentgen rays are concerned. Yet excessive irradiation may cause slight, moderate or severe nephritis. The cells first affected are the epithelial cells of the convoluted tubules. Nephritis should never occur in radiotherapy as applied to human beings. Its appearance must immediately suggest either gross overdosage or excessive elimination of toxic products of cellular degeneration in other more sensitive structures or tissues. Certain animal experiments have shown that, if therapeutic doses are disregarded and if the kidney is exposed to several times an ordinary therapeutic dose, the organ may undergo reactive inflammation leading to chronic nephritis, with increase in blood pressure and the usual reverberations associated with that condition. Such an effect merely shows that the kidney, like all other organs and tissues, is not wholly insensitive to radiation but may be injured more or less severely and permanently if its limit of tolerance is exceeded. But it must not be inferred that ordinary therapeutic irradiation of the kidneys is dangerous.

ENDOTHELIUM

The radiosensitiveness of the endothelium of the blood vessels, pleura and peritoneum is approximately the same as that of the skin. In other words, a dose of roentgen rays insufficient to irritate the skin is not likely to have an appreciable effect on the endothelial cells. When the tolerance of the skin is exceeded, however, the endothelium is likely to suffer temporary or permanent injury. The effect of a grossly excessive dose on the blood vessels is swelling of the endothelial cells, some or all of which in the irradiated area may degenerate and desquamate into the lumen of the vessel. The media also may swell more or less. As the acute phase subsides, the destroyed endothelial cells are replaced by hyperplasia of adjacent cells which may have suffered less, and the intima or the entire vessel wall thickens by hyperplasia of connective tissue. The result is a slow narrowing of the lumen of the affected vessels, which may or may not proceed to the point of complete obliteration. Similar changes occur in the pleura and peritoneum. Naturally the effect of excessive irradiation may not be confined to these structures but may extend to the underlying parenchyma of the lung or to the wall of the intestine or other tissues underlying the peritoneal endothelium. The endothelial degeneration is usually accompanied by hyperemia and serous exudation and terminates by chronic adhesive pleuritis or peritonitis. If the dose of roentgen rays has been sufficiently intense, the injury to the underlying tissues may outweigh the effect on the endothelium and may have serious consequences. It is important, therefore, to keep the dose within safe therapeutic limits.

CONNECTIVE TISSUE CELLS

Young, freshly formed connective tissue cells are more radiosensitive, and mature connective tissue cells are less sensitive to irradiation, than the epithelium of the skin. Young connective tissue, in a healing traumatic or surgical wound, for example, is peculiarly sensitive to roentgen rays and, even after moderate therapeutic exposure, becomes more porous and more brittle. Moreover, moderate therapeutic irradiation of such connective tissue diminishes its formation or tends to hasten the granulation process. This effect appears to be due more to the action of the rays on the leukocytes infiltrating the area, and the connective tissue changes, therefore, are partly secondary or indirect; but a direct effect on the connective tissue cells also occurs. This is evidenced by the influence of roentgen rays on keloids, for which radiotherapy is the most effective treatment. Mature connective tissue cells, on the other hand, are distinctly more resistant than the epithelium of the skin; but, if a dose beyond the limit of tolerance of the skin is given, the connective tissue cells in the exposed territory may also be affected. Some may be destroyed and fresh connective tissue may be formed. This probably has given rise to the assumption that the formation of such tissue may be stimulated by irradiation. Such stimulation is never a direct result of exposure to the rays but is an indirect result and always implies an antecedent destruction of cells of the same or of some other variety.

MUSCLE CELLS

The cells that typify voluntary or involuntary muscles also may be injured or destroyed by exposure to roentgen rays beyond therapeutic limits, but this involves still greater injury or destruction of the overlying tissues or the convergence on the muscle of several beams of rays directed toward it through as many separate fields. Muscle cells are comparatively resistant to the action of the rays and, if not excessive, therapeutic doses should not have a deleterious influence on them. Pathologic changes, such as fatty degeneration, sometimes observed in muscle cells after exposure to roentgen rays, usually result from the circulation of toxic products of cellular degeneration in other more sensitive tissues or structures.

BONE CELLS

Bone has long been thought to be impervious to the influence of roentgen rays. It possesses a relatively high degree of resistance, it is true, but sufficiently intense irradiation, in either single or repeated exposures, may cause the bone cells to degenerate. The degree of effect varies with the dose and with the age of the irradiated animal or person. In early life the growth of bone can readily be retarded or permanently stopped by therapeutic irradiation, especially if the exposures are repeated. Adult bone, however, is able to tolerate rather large doses of roentgen rays without any apparent effect. Irradiation beyond the therapeutic range of dosage may cause the bone cells to degenerate and the bone to become devitalized. In the absence of infection, devitalized bone is slowly replaced by ingrowing new bone, especially if the affected bone is used for weight bearing. When, on the contrary, mechanical function is prevented by fracture or otherwise, the devitalized bone separates as a sequestrum, which is slowly absorbed. Secondary infection of bone devitalized by irradiation leads to sequestrum formation, regardless of function.

NERVE CELLS

As far as experimental evidence shows, the neurons of the central nervous system possess the highest degree of resistance to roentgen rays. The brain and spinal cord can tolerate maximal therapeutic doses and even more with apparent impunity. But this must not be taken to mean that the specific cells of the nervous system are entirely invulnerable to the rays. Nevertheless, in many experiments on animals, in which doses several times greater than those used in the treatment of human beings were administered to the brain or spinal cord, the nerve cells did not show any perceptible evidence of a direct action of the rays. Such cellular changes as have been found after irradiation have appeared to be secondary to the action of the rays on the cerebral vessels, the endothelial lining of which is more sensitive than the nerve cells themselves.

STIMULATING EFFECT OF IRRADIATION

For years the legend that roentgen rays, under certain conditions of dosage, may increase the growth and metabolism of cells has gained wide circulation. This notion has arisen from the attempt to apply to roentgen and radium rays the so-called Arndt-Schulz law, according to which small doses stimulate, and large doses depress, cellular metabolism. Based on pharmacologic grounds, this doctrine has not been generally accepted, even by the pharmacologists. The attempt to apply it to the action of roentgen rays is unwarranted, because the experimental evidence on which it is based is extremely meager and apparently invalid. That a measure of acceleration in cellular metabolism may occur under certain conditions has been shown repeatedly both in animals and in plants, but such unusual acceleration is but a transient phase of the reaction to irradiation and is invariably followed by more or less pronounced inhibition of function and cellular degeneration.

Another factor in the propagation of this notion of a stimulating action of the rays has been the commonly observed regression of pathologic lesions after exposure to small doses of roentgen rays. Such regression is best explained by the exceptional radiosensitiveness of cells, as will be shown in the third section of this chapter.

As the result of a primary degenerative effect on certain cells, a secondary and indirect stimulation may sometimes be observed. Such is the increase in connective tissue cells in certain tissues and organs after repeated irradiation; the connective tissue is laid down to replace other cells which the rays have caused to undergo degeneration. Any primary or direct acceleration of cellular metabolism must be regarded as an effort of the cell to counteract or compensate for the noxious influence of the rays; in other words, it is purely a defense reaction.

Continued acceleration of metabolism cannot be produced by exposure to any dose of roentgen rays or radium, which always cause degenerative changes or have no effect whatever. Repeated irradiation of certain tissues, such as the skin, over a long period of time may cause hyperplasia of the epithelium, and this in turn may lead to malignant transformation. This is

not stimulation in the sense here employed, but the alteration of a normal to an aberrant function due to chronic irritation.

CLINICAL RADIOTHERAPY

RADIUM OR ROENTGEN RAYS

Too much stress on radium or on roentgen rays has been laid by certain writers who, not possessing both agents, have naturally tended to stress the agent which they happened to possess. The question is not one of radium versus roentgen rays but of the relative advantages and disadvantages of each agent. A thorough knowledge of these advantages and disadvantages should govern the indications and contraindications for each. In certain conditions, or in certain phases of the same condition, radium may be preferable to roentgen rays, and vice versa. Sometimes the two agents may be combined to advantage, and some conditions may be treated as effectively with one agent as with the other, the relative advantage then being a matter of time, availability, convenience and cost. Technical considerations may also enter into the decision to use radium or roentgen rays, or both, in a given case.

In a general way radium is preferable when the lesion is well defined, of limited size, and situated at the surface or readily accessible from the surface. Thus a nevus or small keloid may preferably be treated with radium, but it may also be treated with roentgen rays. A large keloid is best treated with roentgen rays, unless a large quantity of radium is available; even then the relative cost makes treatment with roentgen rays preferable. Whenever the lesions cover an area of considerable size, roentgen rays usually are to be preferred, because the affected territory can thus be irradiated more uniformly in less time and at smaller cost. In connection with tumors, sometimes either agent may be used with equal effectiveness, and sometimes the best results are obtained by suitably combining them. In carcinoma of the uterine cervix, for example, the indications for radium treatment are almost ideal, because the cervico-uterine canal permits the introduction of radium into the very center of the malignant process. Moreover, the vaginal cavity makes it possible to apply additional radium to the cervix itself. But the best results are obtained when, besides direct local irradiation with radium, supplementary irradiation with roentgen rays or with a large quantity of radium is directed to the pelvic structures from without.

In the case of a sarcoma of the shoulder, a carcinoma of the lung, a lymphoblastomatous process of the mediastinum or abdomen, an embryoma of the kidney, or a tumor of the testis with metastasis to the para-aortic (retroperitoneal) lymph nodes, adequate irradiation can usually best be done with roentgen rays. Such lesions can be treated with radium only in a few institutions where a quantity of radium large enough to permit external irradiation under satisfactory conditions is available.

In carcinoma of the breast, radium or radon can sometimes be implanted throughout and around the primary growth, but this and the tributary lymphatics should also be irradiated from the outside, either with roentgen rays or with radium. The aim throughout should be to concentrate in and around any malignant process the largest total dose of rays compatible with the integrity of the surrounding normal tissues.

INTERNAL ADMINISTRATION OF RADIUM

Some years ago the internal use of solutions of radium for arthritis, gout, high blood pressure, neuralgia, leukemia and other conditions was advocated and was practiced to a considerable extent, but the results have not been satisfactory and the method has largely been given up, except by the charlatans.

Much has been made also of the therapeutic virtues of the water of certain springs, and claims have often been based on the radioactive content of such water. The quantity of radioactive energy present in the water of most natural springs is quite small—too small to have any perceptible therapeutic effect. Any virtues such water may possess are almost certainly not due to radioactivity. It is probable that the benefit of a stay at such springs results mainly from the regimen in general and not from any radioactive effect of the water.

INFLAMMATORY DISEASES

General Considerations.—So much has been written about radiotherapy for malignant tumors that many physicians are not aware that many forms of acute or chronic inflammation also are amenable to treatment with roentgen rays. Other physicians who, to some extent, may be familiar with the therapeutic possibilities of roentgen irradiation for various inflammatory processes hesitate nevertheless to make use of the method because they fear either the deleterious effects of excessive irradiation on the skin, not infrequently encountered after the treatment of tumors with maximal doses, or the systemic reaction with which such treatment is often associated. As far as inflammatory lesions are concerned, provided the treatment is administered by a radiologist who has had substantial experience with the treatment of inflammations, such fears are unfounded.

For the benefit of those who may not be familiar with the subject, it must be emphasized that radiotherapy for inflammatory conditions is an entirely separate field from the treatment of malignant neoplasms. In the latter the aim must be to deliver to every part of a tumor the largest total dose of rays compatible with the integrity of the overlying and surrounding tissues, while, in the former, comparatively small or moderate doses are employed. Large doses that might jeopardize the integrity of the skin are not only unnecessary but should be carefully avoided as less effective and sometimes as actually dangerous. The risk of complicating the inflammation already present by inducing inflammatory reaction to an excessive dose of rays may lead to spread rather than resolution of the primary inflammation.

Acute.—Many forms of acute inflammation yield quite rapidly to a single, small dose of rays. In some cases, in order to cause complete resolution of the pathologic process, it may be advisable to repeat irradiation after an interval of from six to ten days. By a small dose of rays is meant a dose representing less than one-half the tolerance dose of the skin; a dose as small as one-fourth the so-called erythema dose is often sufficient, but the exact dose must vary somewhat according to the character of the lesion in each case. A significant point is that, other things being equal, the more acute the lesion, the smaller the dose of rays required. Another significant point is that the results are most striking and prompt when the lesions are irradiated early, during the stage of leukocytic infiltration and before suppuration has set in. Irradiation later

may still be useful, in that suppuration is favored and the process may thus be shortened to an extent which varies with the stage of the lesion at the time of irradiation. Another advantage of the method, especially for early lesions, is prompt relief from pain, although sometimes relief may be preceded by actual increase in pain for a brief period.

As examples of inflammatory lesions notably amenable to roentgen irradiation may be mentioned furuncle, carbuncle, acute simple adenitis, acute parotitis complicating operations on the colon and other abdominal structures, abscess and cellulitis of soft tissues, onychia and paronychia, mastitis, sinusitis and mastoiditis in selected cases, and delayed resolution of lobar pneumonia.

The favorable influence of irradiation on furuncle and carbuncle, especially when treated early, has been demonstrated by Coyle, Dunham, Ross, Richards, Lewis and many others. Prompt and marked benefit is derived in a large proportion of cases. Indeed, when treated early, relief from pain within a few hours and rapid resolution are the rule. When treated late, suppuration tends to be hastened, and surgical drainage may have to be instituted earlier than would be the case if the lesion had not been irradiated. As already mentioned, the treatment is most effective during the early stage when other methods of treatment are least effective; it is painless and inexpensive and does not interfere with the patient's activities; it often relieves pain in a short time, makes hot or other dressings unnecessary or shortens the period during which they must be applied; it often avoids an operation, and it usually yields a better cosmetic result. The dose of rays is so small that reaction of the skin or of the gastro-intestinal tract does not occur. Consequently, the treatment may be given to weak and febrile patients without danger.

Ocular Lesions.—Certain inflammatory conditions of the eye can be treated effectively with radium or with roentgen rays. In dealing with such lesions the advantage usually lies in roentgen irradiation, because the small doses required can be given in a much shorter time and without the difficulty and discomfort incidental to the application of radium to a mobile and sometimes acutely inflamed structure. The dose of rays must never exceed 80 per cent of an erythema dose; otherwise, early conjunctivitis or late degeneration of the crystalline lens may follow. This is especially prone to occur in children.

Parotitis, Acute.—Certain operations, notably on the colon, are complicated by acute parotitis, and a high mortality rate is attached to this complication. In such cases early exposure of the parotid regions to a small dose of roentgen rays or radium has been found effective in controlling and in arresting this variety of inflammation, and the mortality rate has thus been notably reduced. When the patient's condition allows him to be moved to a nearby treatment room, irradiation with roentgen rays is simpler and requires less time than that with radium. But if the patient's condition is such that any movement is to be avoided, treatment with radium is preferable because it can be administered without disturbing the patient.

Not all acute inflammatory lesions respond favorably, but a large percentage may be counted on to do so. Moreover, if the pathologic process is not favorably influenced, its evolution is not perceptibly altered.

(To be continued)

Council on Pharmacy and Chemistry

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

PAUL NICHOLAS LEECH, Secretary.

BACILLUS ACIDOPHILUS CULTURE (B. A. CULTURE) OMITTED FROM N. N. R.

Bacillus Acidophilus Culture (B. A. Culture), manufactured by the B. B. Culture Laboratory, Inc., was accepted for inclusion in New and Nonofficial Remedies in 1926. The product is a concentrated culture or suspension of B. acidophilus stated to contain not less than 100 million organisms (Bacillus acidophilus) per cubic centimeter at the date of issue.

At the expiration of the last three year period of acceptance in 1932, the product was reaccepted for one year only, on account of the fact that the Council is reconsidering the whole status of bacillus acidophilus therapy. At that time certain revisions of the firm's label and circular were required. For the Council's reconsideration in 1934, the firm submitted proof of label and circular revised to meet these objections. These revisions were found acceptable except for the use of the initials "B. A." In its reconsideration, the Council found two objections to the continued acceptance of this concentrated culture or suspension of B. acidophilus.

The first, a general objection, is that there appear to be available no published reports satisfactorily proving that broth cultures, whey cultures and concentrates of B. acidophilus are therapeutically useful. One of the Council's consultants, who is thoroughly familiar with this field, has written in answer to a question concerning the therapeutic value of this type of product: "I know of no references good or bad on clinical studies dealing with the therapeutic value of acidophilus cultures and concentrates." The facts are that all thorough clinical studies have been made with B. acidophilus milk and the information derived from them has been transferred to the cultures and concentrates. In its submitted advertising the B. B. Culture Laboratory, Inc., claims: "In the conditions mentioned above, where the implantation of B. acidophilus is indicated, Bacillus Acidophilus Culture (B. A. Culture) will be found effective, convenient and economical." The Council must regard this claim as being unwarranted until the firm submits convincing evidence to support it.

The second objection relates to the instability of these cultures and concentrates. It has been known for a long time that Bacillus acidophilus loses viability rapidly in these preparations. Bacteriologic analyses made for the Council by a competent investigator in this field show this clearly for several preparations of this sort, among which were two samples of this Bacillus Acidophilus culture. The results of these tests were as follows:

Two samples of the Bacillus Acidophilus Culture of the B. B. Culture Labotarory, Inc., were obtained in New York at 8 p. m. on May 28, 1934. The date of manufacture was stated on the label to be May 25, 1934. The expiration date was July 20, 1934. Counts of Bacillus acidophilus were as follows:

Medium	No. of Viable B. Acidophilus Organisms: At Date of Purchase, 5/29/34	At Date of Expiration, 7/20/34
Tomato juice agar *p*H 6.6		
(*a*) in 10% carbon dioxide.....	655 million	1 million
(*b*) in air	670 million	1 million
Casein digest agar *p*H 7.1		
(*a*) in 10% carbon dioxide.....	656 million	1 million
(*b*) in air	659 million	1 million

These counts show that the product deteriorated greatly in storage at 10-18 C. during fifty-two days, which was four days less than the eight weeks expiration period. The firm's label guarantees "not less than 100 million viable B. acidophilus at the expiration date." This claim is obviously unwarranted in view of these observations.

The general article Lactic Acid-Producing Organisms and Preparations in N. N. R. contains the statement (New and Nonofficial Remedies 1935, p. 263) that the expiration date for B. acidophilus milk preparations will "usually be one week, and probably less than two weeks, after the date of manufacture." Since some of the milk preparations appear to be quite stable, the Council has extended their expiration date to three weeks during a trial period. The cultures and concentrates should have expiration periods shorter than those of the milk products. Certainly the period of eight weeks used by this firm was much too long. It is doubtful whether these cultures and concentrates can be satisfactorily marketed within the brief expiration period, probably less than one week, during which the viability of B. acidophilus organisms in them can be maintained.

The type of culture in this preparation was found to be an intermediate rough form. It is not certain that this preparation represents the true intestinal type of B. acidophilus suitable for implantation.

The Council voted to omit Bacillus Acidophilus Culture (B. A. Culture) of the B. B. Culture Laboratory, Inc., from New and Nonofficial Remedies because there is insufficient evidence supporting claims for its therapeutic value and because, like other cultures and concentrates, it is subject to great deterioration.

The foregoing statement of the Council's consideration was transmitted to the B. B. Culture Laboratory, Inc. The firm replied, raising objections and asking for postponement of the publication of the Council's statement. Publication was withheld pending the results of a reinvestigation of some of the problems involved.

The firm objected to the classification of its product as a culture concentrate. Since the product has always been described in New and Nonofficial Remedies as a "pure aqueous suspension of Bacillus acidophilus," and since the firm has never objected to this description, there is little basis for such objection. The firm now states that: "This culture is a natural 24-hour growth in a medium developed by us and is not a concentrate." As there are more serious objections to the product, the Council's only concern here is to make sure that the preparation is accurately described in this statement. The firm has indicated that the product is a culture which has not been concentrated by artificial means.

The firm objected to the requirement that the initials "B. A." be removed from the name, but expressed willingness to consider any specific objections to the use of these letters. The letters are now in conflict with the Council's rule 8 and would have to be deleted if the product should be reaccepted.

In answer to the objection that there is no evidence for the therapeutic value of this product, the firm submitted three references to published papers and stated: "The best evidence of success following this treatment is after all the testimony of physicians which comes to us. Unfortunately, perhaps, this evidence was not given us for publication." The Council has considered the papers of Coleman, Gompertz and Vorhaus, and Albee, which were referred to by the firm.

Coleman (THE JOURNAL, Aug. 4, 1917, p. 329) does not claim that B. acidophilus therapy had any specific value in typhoid fever, but that it did reduce diarrhea and tympanites. All the patients treated by him received a high calory diet and were kept in good nutritional condition. He emphasizes, as do others, the importance of the general nutritional state of these patients. There is little or nothing in his reports to show that patients treated with the B. acidophilus culture prepared by Torrey were better off than those given lactose and good care without the culture. It may be concluded from his paper, however, that diarrhea and tympanites were probably reduced by the B. acidophilus therapy. The organisms were administered in cultures prepared especially by Dr. Torrey and the patients were not treated with a commercial preparation. These results cannot be transferred to the use of "B A. Culture" without confirmation by actual test.

The article by Gompertz and Vorhaus (THE JOURNAL, Jan. 13, 1923, p. 90) gives no information on the type and source of the culture used. Implantation of B. acidophilus was apparently obtained by these investigators, though the bacteriologic studies, limited largely to examination of stained specimens, are deficient.

The Council does not deny that implantation of B. acidophilus can be secured by the oral administration of suitable broth cultures. It is, however, not impressed with the work done thus far in the therapeutic use of broth cultures, suspensions or concentrates; it believes that convincing evidence is needed to show that the commercial preparations of this type are therapeutically effective.

The paper by Albee (*Am. J. Surg.* **23**:70 [Jan.] 1934) does not give any analyzable or convincing evidence. The title of the paper is "Myofascitis," a term coined by Dr. Albee to designate vague muscle and joint pains, lumbosacral troubles and a number of ill defined conditions. He used manipulation, massage and colonic irrigation along with cultures of B. acidophilus in the treatment of his patients. The Council recognizes the fact that the element of psychotherapy in the treatment of patients of this type together with the effect of general dietary and hygienic regulation may have great influence on the results obtained. There are no bacteriologic data in Dr. Albee's paper.

In view of the firm's reference to the "testimony of physicians not given us for publication, . . ." the Council again points out that the usual testimonial letter of a physician does not constitute scientific evidence. The Council could not regard as convincing letters of that sort which may be in the firm's file.

At present the Council knows no reason to change its opinion (*a*) that there is no satisfactory evidence that culture-preparations of this type are therapeutically effective and (*b*) that there is no satisfactory evidence to support the claim advanced by the firm in the sentence: "In the conditions mentioned above, where the implantation of B. acidophilus is indicated, Bacillus Acidophilus (B. A. Culture) will be found effective. . . ."

The firm was requested in January 1935 to submit evidence in the form of reports of carefully controlled studies of (1) the implantation of B. acidophilus in the intestine of man by the administration of "B. A. Culture" and (2) therapeutic effects from the use of this culture or other culture preparations, exclusive of B. acidophilus milk.[1]

The firm criticized the bacteriologic report reproduced in the Council's statement previously transmitted to the firm and presented the results of routine analyses made by Dr. Kopeloff and by the firm as evidence that the Council's statement was not accurate. After correspondence with the firm there was received a supply of the firm's own special medium. Samples of the firm's product were purchased on the New York market and arrangements were made for a bacteriologic examination to be made by a competent worker under the supervision of the Council's referee. Every care was taken to follow the directions specified by the firm in the plate count procedures, the care and handling of specimens and in all other details. The results of this analysis are as follows:

I. Tests of viability of B. acidophilus in the B. A. Culture under conditions recommended by the firm to the user. Bottles opened were returned to the refrigerator at 50 F. after each sample was withdrawn. The firm advised in its letter of Jan. 26, 1935: "Tests of viability after opening bottles should not be made more than ten days after bottle is opened."

Two samples were examined in this way under the referee's supervision. The results, according to two methods, were as follows:

Sample 1. "Produced Jan. 23, 1935. Expires March 11, 1935." Purchased Feb. 4, 1935. Examination begun Feb. 8, 1935.

Bacillus acidophilus counts (maximum of any dilution).

Days After Opening Bottle	B. B. Laboratory Medium	Tomato Agar Under Carbon Dioxide
0	540,000,000	600;000,000
2	150,000,000	370,000,000
4	40,000,000	30,000,000
6	10,000,000	9,000,000
8	20,000,000	10,000,000
10	7,000,000	3,000,000

This shows that viability of the organisms was lost rapidly. The product was below the minimal Council standard six days after the bottle had been opened.

1. At the time this addition to the original statement was formulated, the firm had not furnished any new evidence on these points.

Sample 2. "Produced Feb. 4, 1935. Expires March 20, 1935." Purchased Feb. 6, 1935. Examination begun Feb. 8, 1935.
Bacillus acidophilus counts (maximum of any dilution).

Days After Opening Bottle	B. B. Laboratory Medium	Tomato Agar Under Carbon Dioxide
0	770,000,000	720,000,000
2	710,000,000	670,000,000
4	710,000,000	630,000,000
6	670,000,000	660,000,000
8	230,000,000	400,000,000
10	30,000,000	30,000,000

The deterioration in sample 2 was less rapid than in sample 1, but it was below the minimal Council standard by the tenth day after the opening of the bottle. It is to be noted that this was a fresher sample than sample 1. Sample 1 was sixteen days old when the examination was started, while sample 2 was examined four days after the date of production.

II. Tests of viability of B. acidophilus in the B. A. Culture product under conditions of storage at intervals during the expiration period of approximately fifty days as indicated by the firm:

The ten unopened samples were stored in a dark refrigerator at 50 F. Each bottle was used only once. It was opened for the withdrawal of a specimen and then discarded. This procedure was adopted in compliance with the firm's directions in its letter of Jan. 26, 1935. The results were as follows:

Sample	Date of Production	Date of Expiration	Date Examined	Storage Days After Production	B. Acidophilus Counts (Averages)	
					B. B. Laboratory Medium	Tomato Agar Under Carbon Dioxide
9	2/11/35	3/28/35	2/27/35	16	49,000,000	55,500,000
10	2/11/35	3/28/35	2/27/35	16	67,500,000	69,500,000
11	2/11/35	3/28/35	3/ 3/35	20	85,000,000	85,000,000
12	2/11/35	3/28/35	3/ 3/35	20	67,000,000	74,000,000
6	2/ 6/35	3/20/35	3/ 8/35	30	4,000,000	3,000,000
7	2/ 6/35	3/20/35	3/ 8/35	30	12,000,000	9,000,000
3	2/ 4/35	3/20/35	3/16/35	40	500,000	1,500,000
8	2/ 6/35	3/20/35	3/16/35	40	600,000	330,000
4	1/ 2/35	3/21/35	2/21/35	50	1,000,000	1,000,000
5	1/ 2/35	3/21/35	2/21/35	50	3,000,000	1,000,000

These tests show that with one exception (sample 1) none of the purchased specimens examined contained 100,000,000 viable B. acidophilus organisms at ten day periods within sixteen to fifty days after the dates of manufacture. The tests of samples 1 and 2 and other counts made by the firm and by examiners for the Council have shown that at about the date of manufacture this product contains approximately 600 to 700 million viable acidophilus organisms per cubic centimeter. The loss of viability that occurs, even under conditions specified by the B. B. Culture Laboratory, Inc., is perfectly evident from these figures.

The opinion that the product is unstable and subject to great deterioration is thus confirmed.

Attention is called to the fact that the firm's own special medium was used in accordance with directions received from the firm and was no better than tomato agar for these counts.

The colonies of B. acidophilus were larger in the B. B. medium. They were surrounded by an opaque zone, giving the impression that there is some acid-precipitable material, possibly a protein in the B. B. Laboratory medium.

The type of colony from the B. A. Culture in B. B. medium was round, very compact, with well defined edges and occasional filamentous projections. In general, they appeared to be of the so-called intermediate type, as were also colonies of the same culture in tomato agar. They resembled the colonies of lactobacilli from grain more than the colonies of a typical X rough strain known to be derived from the intestinal tract of man. The typical X strain did not produce a precipitate in the B. B. Laboratory medium.

The Council on Pharmacy and Chemistry reaffirmed its decision to omit from New and Nonofficial Remedies the Bacillus Acidophilus Culture (B. A. Culture) product of the B. B. Culture Laboratory, Inc., because the product is unstable and is subject to rapid deterioration, and, further, because there is insufficient evidence to support the therapeutic claims made for the product by the B. B. Culture Laboratory, Inc.

Committee on Foods

THE COMMITTEE HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS.

RAYMOND HERTWIG, Secretary.

WITHDRAWAL OF ACCEPTANCE

COCOMALT

Manufacturer.—R. B. Davis Company, Hoboken, N. J.

Description.—Mixture of sucrose, skim milk, cocoa, malt extract, vanillin flavoring and added vitamin D (irradiated ergosterol) 81 U. S. P. units per ounce.

Withdrawal of Acceptance.—Under date of November 6 the manufacturer requested withdrawal of acceptance from Cocomalt which has been accepted since March 1932 (THE JOURNAL, June 4, 1932, p. 1991). Reasons for requesting withdrawal were not stated.

Submission of Cocomalt for acceptance was entirely voluntary on the part of the manufacturer. The product was accepted with the understanding that both the product and its advertising would be maintained in complete accord with published Rules and Regulations and General Decisions of the Committee. Manufacturers of accepted foods assume no other obligations with respect to the Committee or the American Medical Association. There are no charges accompanying the initial acceptance of foods nor subsequently.

In accordance with the request, Cocomalt will no longer be listed as an accepted food nor the company privileged to display the Committee seal on the package label or in advertising.

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG, Secretary.

ADVERTISING BOOKLET "THE HAWAIIAN ISLANDS AND THE STORY OF PINEAPPLE"

Sponsor.—American Can Company, New York.

Description.—Popular booklet descriptive of the Hawaiian Islands, circumstances surrounding early discovery of the pineapple, development of the pineapple industry, and modern methods of cultivation, harvesting and packing the fruit. A brief statement of the food value of canned pineapple and suggestions and recipes for its use in cookery are included.

DIXIE BRAND SANDWICH BREAD
DIXIE BRAND TWIST BREAD

Manufacturer.—Malbis Bakery Company, Mobile, Ala.

Description.—Prepared from flour, water, sugar, whole milk, lard, skim milk, salt, yeast, malt extract, and a yeast food containing calcium sulphate, ammonium chloride, sodium chloride and potassium bromate (method described in THE JOURNAL, March 5, 1932, p. 817).

LADY CLARE BRAND EVAPORATED MILK

Distributor.—M. Muskal, Chicago.

Manufacturer.— The Oatman Condensed Milk Company, Dundee, Ill.

Description.— Canned, unsweetened evaporated milk. The same as Oatman's Brand Evaporated Milk (THE JOURNAL, April 16, 1932, p. 1376).

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SATURDAY, DECEMBER 21, 1935

THE ELEVENTH REVISION OF THE PHARMACOPEIA OF THE UNITED STATES OF AMERICA

One hundred and twenty years has passed since Dr. Lyman Spalding, a physician, issued a call for "gentlemen, willing to act and men distinguished for their ability and learning" to formulate a pharmacopeia. Their object was to "select from among substances which possess medicinal power, those, the utility of which is most fully established and best understood; and to form from them preparations and compositions in which their powers may be exerted to the greatest advantage." These articles were to be distinguished by "convenient and definite names."

During its early history the Pharmacopeia was decidedly an undertaking by physicians. Gradually the necessity for pharmaceutical advice developed, and the revisions of the last three editions have been dominated largely by those representing pharmacy rather than medicine. In the 1920 revision there was a fortunate agreement whereby the scope of the pharmacopeia was left entirely to the medical members of the Revision Committee even though they composed only one third of the group; the pharmaceutical interests were responsible for questions of pharmacy. Before the issuance of a new Pharmacopeia, pharmaceutical schools, medical schools, societies, certain government agencies and other organizations send delegates to the Pharmacopeial Convention. In 1930, at Washington, pharmaceutic interests, with certain manufacturing interests, gave little heed to those representing scientific and progressive medicine. Fortunately, Dr. E. Fullerton Cook who had successfully revised the previous edition of the Pharmacopeia, was appointed chairman of the Revision Committee.

The new Pharmacopeia is now at hand. While this Pharmacopeia has lacked the able judgment of some of the most valuable leaders in pharmacology and medicine, owing to the 1930 political manipulations,[1] the book is to be commended. Evidently under the successful guidance of Dr. Cook the members have given serious consideration to the admonitions of the medical profession. The new Pharmacopeia follows the old one in style and general method of presentation. The progress of the revision may be measured in part by the deletions.[2] The committee reports that 119 products have been deleted either because they had been superseded by better products pharmaceutically or medically or because their period of usefulness had expired in view of more modern methods of treatment.

The new additions to the Pharmacopeia, of which there are fifty-eight, include Calcium Gluconate, Carbon Dioxide, Chiniofon Powder, Ephedrine and the Hydrochloride and Sulfate, Ethylene, Histamine Phosphate, Iodophthalein Soluble (Tetraiodophenolphthalein Sodium), Merbaphen, Mercuric Succinimide, Mild Tincture of Iodine, Neocinchophen and Parathyroid Solution. Thirty-nine of the new additions are already familiar to physicians in New and Nonofficial Remedies; sixteen are so well established that they appear in Useful Drugs. Of course there are a number of drugs without which the physician cannot practice successfully which are not included in the Pharmacopeia. This is in accord with the recognized policy of the Pharmacopeia that monopolized substances are not admissible; thus, as long as there is a patent for insulin it cannot be admitted. There are also other drugs, such as certain mercurials, arsenic preparations and antiseptics, for which the physician will continue to rely on New and Nonofficial Remedies for his guidance. It would seem well, if an interim revision is issued, that a shorter acting barbiturate be included. For instance, pentobarbital sodium is a nonproprietary drug having the necessary short-acting attributes.

It will be well for physicians to notice that the forthcoming edition of the Pharmacopeia has made one radical change in the matter of percentage. In the introduction it is stated that the percentage shall be "weight in volume" unless otherwise indicated. This means that in each prescription containing such heavy substances as glycerin the total amount of the other

1. A discussion of the 1930 convention appears in THE JOURNAL, May 24, 1930, p. 1707.

2. Aconitine; Crude Tetanus Antitoxin; Water; Benzaldehyde; Buchu; Calcium Glycerophosphate; Calumba; Lime; Chlorinated Lime; Gamboge; Wood Charcoal; Cimicifuga; Cinchonidine Sulphate; Cinchophen; Colchicum Corm; Colocynth; Cotarnine Chloride; Cubeb; Elaterin; Capsicum Plaster; Lead Oleate Plaster; Eucalyptus; Extract of Colchicum; Extract of Colocynth; Compound Extract of Colocynth; Saccharated Ferrous Carbonate; Ferric Chloride; Soluble Ferric Phosphate; Exsiccated Ferrous Sulphate; Granulated Ferrous Sulphate; Fluidextracts of Bella donna Leaves, Buchu, Cimicifuga, Cinchona, Colchicum, Eucalyptus, Pomegranate, Hydrastis, Hyoscyamus, Rhubarb, Rhus Glabra, Rose, Squill, Senega and Uva Ursi; Gambir; Glycerite of Phenol; Pomegranate; Guaiacol Carbonate; Red Mercuric Iodide; Hydrastis; Hyoscyamine Hydrobromide; Infusion of Digitalis; Ipomea; Jalap; Krameria; Lime Liniment; Solutions of Arsenous and Mercuric Iodide, Iron and Ammonium Acetate, Lead Subacetate, Potassium Citrate, Potassium Hydroxide, Chlorinated Soda, Sodium Hydroxide and Zinc Chloride; Lobelia; Malt; Manna; Honey of Rose; Morphine Hydrochloride; Oleoresin of Capsicum; Oil of Cajuput; Oil of Caraway; Croton Oil; Paraformaldehyde; Pepo; Phosphorus; Pilocarpine Hydrochloride; Pills of Asafetida; Compound Pills of Mild Mercurous Chloride; Pills of Phosphorus; Lead Monoxide; Compound Powder of Jalap; Compound Powder of Rhubarb; Quassia; Quinine Hydrochloride; Quinine Hydrobromide; Quinine Tannate; Resin of Ipomea; Resin of Jalap; Rhus Glabra; Rose; Salacin; Senega; Sodium Indigotindisulphonate; Strontium Salicylate; Strophanthus; Sulphonmethane; Syrup of Rhubarb; Compound Syrup of Squill; Syrup of Senega; Syrup of Ginger; Tinctures of Asafetida, Calumba, Cardamom and Cinchona; Compound Tincture of Gambir; Tinctures of Krameria, Lobelia, Rhubarb and Strophanthus; Ammoniated Tincture of Valerian; Tincture of Ginger; Troches of Tannic Acid; Troches of Ammonium Chloride; Elm; Iodoform Ointment; Ointment of Lead Oleate, and Uva Ursi.

ingredient(s) will have a different value than if the usual weight/weight method of expression were employed in terms of percentages.

Within the last two years the Committee on Revision in cooperation with the Board of Trustees of the U. S. Pharmacopeial Convention has initiated a practice of issuing an "interim revision." This has now become an established policy. It has the advantages of early correction of serious mistakes and the necessity of making products conform with new manufacturing processes. However, it has the decided drawback of requiring the physician to keep constantly in mind any possible changes which the committee may issue affecting prescription practice and may easily become a hardship on manufacturers. It is hoped, therefore, that these revisions will be issued most conservatively.

The nomenclature used in certain instances in the new Pharmacopeia is unfortunate. For instance, physicians are asked to prescribe "Theophylline with Ethylene Diamine," a most difficult term to write in prescriptions, when there was already available to the Pharmacopeia the nonproprietary name Aminophylline. At the last moment the Pharmacopeia has included the name Aminophylline as a synonym. It has also used the cumbersome term of the British Pharmacopeial Commission, "Solution of Irradiated Ergosterol," when the nonproprietary name "Viosterol in Oil" would have been simpler. In the interest of the medical profession THE JOURNAL will continue to use the terms Aminophylline and Viosterol in Oil. There are, of course, many changes in spelling, such as the ph in sulphur changed to f. As has so often been said, common usage establishes a name. Seldom did one use the word "Gluside" in prescribing saccharin, so the Pharmacopeia has reverted to the old term "Saccharin." Names and standards for the ten newly admitted biologicals (a Typhoid, a Typhoid-Paratyphoid and Rabies Vaccines; Scarlet Fever Streptococcus Toxin and the Antitoxin; Diphtheria Toxoid and the Toxin for Schick Test; Antipneumococcic (Type I) and Antimeningococcic Serums, and Old Tuberculin) were provided by the National Institute of Health. A subcommittee on vitamins, responsible for the Interim Revision of Cod Liver Oil, will oversee standards on this vitamin A and D containing substance. The International Units of vitamins A and D and digitalis have become the official U. S. P. units, with some modifications. It is interesting to note the description of liver and stomach preparations. Here no standards are given, but the Pharmacopeia endeavors to control these products with the following statement: "This Board will indicate liver and stomach preparations which are of Pharmacopeial quality—as indicated by submitted clinical data." There have been some who have questioned the constitutionality of the Pharmacopeia since, in effect, it confers on an individual (corporation) legal prerogatives that are possessed only by the government. Some have taken issue on each side of this question. In view of the recent decisions of the Supreme Court on the NRA, reference to an advisory committee of the determination of the acceptability of liver preparations is doubtful from a legal point of view.

Of course many of the drugs that were in the Pharmacopeia have been transferred to the National Formulary, long a repository of discarded drugs. An interesting conflict arises, however. The new National Formulary,[3] also now available, has made official certain ampule dosage forms; for instance, ampules of dextrose are now described. By interpretation, ampules of other dosage forms of Pharmacopeial drugs may be looked on as nonofficial preparations. The National Formulary states that ampules of dextrose "contain a sterile solution of approximately 50 Gm. of anhydrous dextrose," yet anhydrous dextrose is not official in the Pharmacopeia or the National Formulary. If a physician should prescribe a solution of dextrose, but not in ampule form, there would be dispensed the hydrous dextrose of the Pharmacopeia. This alone would lead to an error of 5 Gm. in 100 cc. of a 50 per cent solution.

For the most part the latest edition of the Pharmacopeia is indeed a credit to the Revision Committee. THE JOURNAL and the Council on Pharmacy and Chemistry have consistently urged that physicians prescribe official preparations whenever possible.[4]

LEGISLATION PENDING IN CONGRESS CONCERNING FOOD, DRUGS, COSMETICS AND THERAPEUTIC DEVICES

Since Senator Copeland first introduced the so-called Tugwell food, drug, therapeutic device and cosmetic bill [1] in the Senate, in the Seventy-Third Congress, numerous other bills of similar purpose have been offered in both the Senate and the House of Representatives. Those introduced in the Seventy-Third Congress died when that congress expired, Jan. 3, 1935. Such bills [2] as have been introduced in the Seventy-Fourth Congress are still pending. Outstanding among these is S. 5, introduced by Senator Copeland and commonly called the Copeland bill. It is officially entitled "An Act To prevent the adulteration, misbranding, and false advertising of food, drugs, devices, and cosmetics in interstate, foreign, and other commerce subject to the jurisdiction of the United States, for the purposes of safeguarding the public health, preventing deceit upon the purchasing public, and for other purposes."

The Copeland bill, after many amendments and in a form much different from that in which it was introduced, was passed by the Senate, May 28, 1935. It then went to the House of Representatives, where it was referred to the Committee on Interstate and

3. Comment on the National Formulary VI will appear in next week's issue of THE JOURNAL.

4. In following this policy, the Council on Pharmacy and Chemistry has in course of preparation an Epitome of the U. S. Pharmacopeia and the National Formulary, revised in accordance with the new additions.

1. Seventy-Third Congress, S. 1944.

2. Seventy-Fourth Congress, S. 5, S. 580, H. R. 3972, H. R. 6145, H. R. 6688, H. R. 6906, H. R. 8744, H. R. 8805, H. R. 8941.

Foreign Commerce, which in turn referred it to a subcommittee, along with other bills of similar purport. The subcommittee has given extensive hearings on these bills and now has them under consideration. It may be expected to report to the full committee shortly after Congress convenes next January. The committee, after considering the subcommittee's report, will then report a bill to the House of Representatives. This bill may be either the Copeland bill in the identical form in which it passed the Senate, or the Copeland bill with amendments, or an entirely new bill, possibly composed of the good features of all pending legislation. The bill reported by the committee will then take its place on the House calendar and, depending on parliamentary procedure, come before the House for debate and action. If it passes, it will in the ordinary course of events be returned to the Senate. The differences in the bill as passed by the two bodies will be adjusted through conference committees before the bill is eventually sent to the President for action.

If such a bill is passed and approved by the President, it will become a law on the day the President signs it, unless some other day is named in the bill. In bills of this character it is customary to provide that the bill, in whole or in part, shall not become effective until some date considerably after the date of approval, so that business may adjust itself to the requirements newly imposed on it. The Copeland bill provides a waiting period of twelve months after its approval before its penal provisions become effective.

Every one interested in the enactment of federal food and drug legislation better than that which now prevails and in the extension of such legislation to protect the public against fraud and danger in cosmetics and prophylactic and therapeutic devices must recognize that the present Copeland bill is the result of many compromises. On its face, the bill may appear to be materially more rigid in its requirements than the Food and Drugs Act of 1906. It does cover cosmetics and therapeutic devices, which existing law does not cover at all. It is more rigorous in its requirements on the labeling of foods and drugs and in covering advertising as well as labeling. A careful study, however, discloses loopholes and evidences of weakness in its administrative provisions, particularly with reference to drugs, including "patent" and proprietary medicines, and prophylactic and therapeutic devices. These should be corrected before the bill is enacted.

A critical analysis of the Copeland bill now pending before the subcommittee of the Committee on Interstate and Foreign Commerce of the House of Representatives, by the Bureau of Legal Medicine and Legislation of the American Medical Association, appears elsewhere in this issue.[3] The subcommittee, it is hoped, will develop a bill free from such defects as are pointed out in this analysis. Legislation should be enacted in a form better designed for the protection of the consumer than is the present bill. The Association and its several constituent state associations and component county societies, and Fellows and members of the Association individually should do what they can to bring about that result.

3. Page 2055.

Current Comment

ANTHRAX IN IMPORTED HAIR

Anthrax is unique in many ways in the history of bacteriology. Robert Koch's demonstration in 1876 of the anthrax bacillus as the cause of this disease was in fact the beginning of modern bacteriology. Davaine in 1863, however, had produced experimental infections with blood containing anthrax bacilli and suggested an etiologic relation. Anthrax is primarily a disease of herbivorous animals, especially sheep, cattle, goats, hogs and horses. In some European and Asiatic countries, thousands of animals succumb to this infection each year. In America the disease occurs infrequently in man. The Bureau of the Census reports that nine deaths from anthrax occurred in the United States in 1934, eleven in 1933 and twelve in 1932. Now comes a record of the occurrence of ten cases in the last two years in Delaware County, Pa. A mill that imports goat hair from China and India for the manufacture of inner lining had been in operation more than twenty years without ever having a case of anthrax until March 1933. Gold [1] reports ten cases, seven of which occurred in persons working in the mill and two in children living in the village surrounding the mill; the remaining case occurred at a distance, the infection having been carried from the mill either by shipping cases or by hair bobbins. The diagnosis in each case was confirmed by bacteriologic cultures. The first case developed in a youth, aged 18, who scratched his face while working in the carding room. A typical anthrax lesion developed, together with edema over an area 3 inches in diameter. The patient was treated by the local administration of antianthrax serum into the affected area, as well as by intravenous injections. However, the disease spread and the patient died in about five days from the time his face was scratched. It was thought that the local administration of the antianthrax serum possibly encouraged the spread of the infection in this case by the mechanical separation of the tissues. Serum was not administered locally in any of the other nine cases, and all the patients recovered. Following the optimal dose of antianthrax serum administered either intramuscularly or intravenously, definite results promptly occurred; the temperature and pulse rate dropped and the edema disappeared in a short time. However, neither the adenopathy nor the anthrax bacilli were so promptly affected, and in some cases anthrax bacilli were recovered from the lesions late in the course of the disease, when the patients seemed to be practically well. Fortunately, antianthrax serum did not produce in these cases any severe reactions, even though enormous doses were given. As much as 1,000 cc. of serum as the initial dose was given, followed later by one or more injections of 100 cc. each

1. Gold, Herman: Studies in Anthrax: Clinical Report of Ten Human Cases, J. Lab. & Clin. Med. **21**: 134 (Nov.) 1935.

into the muscles. While other patients received smaller initial doses, the average total amount given to the patients who recovered was 943.3 cc. Neoarsphenamine in addition to the antianthrax serum was used in some of the earlier cases but was discontinued, as it did not seem to be of benefit. The facts brought out in the investigation show that this strain of anthrax bacilli was especially virulent. Two cases occurred one year after the last previous case developed, and yet during that time there had been no change in the raw material used at the mill or in its processing. Were the last two cases a recurrence of the previous infection or was a new shipment of hair, which had just arrived from the Orient, responsible for the fresh outbreak? Bacteriologic tests on the new bales of hair showed that anthrax bacilli were present in the center of a bale as well as in sweepings of the storeroom floor. These ten cases indicate that it is possible for products infected with virulent anthrax organisms to be shipped into the United States without detection, even though quarantine regulations to prevent such disasters are operating.

Medical Economics

DISTRIBUTION OF PHYSICIANS UNDER INSURANCE

An oft repeated indictment against the system of private practice of medicine in the United States is that it leads to an inequitable distribution of medical facilities. The advocates of compulsory sickness insurance and "socialized" medicine cite the fact (unaccompanied by an analysis of population characteristics) that in 1931 there were 614 persons per physician in New York and 1,400 in South Carolina as evidence of the need to introduce insurance or some similar scheme as a means of distributing physicians more closely in relation to population.

Distribution of Physicians in Prussia

District	1932 Physicians	1933 Population per Physician
Königsberg	621	1,542
Gumbinnen	206	2,651
Allenstein	184	3,003
Westpreussen	128	2,167
Potsdam	894	1,582
Frankfort	662	1,980
Berlin	6,791	625
Stettin	780	1,584
Köslin	278	2,466
Grenzmark	152	2,181
Breslau	1,513	1,285
Liegniss	756	1,666
Oppeln	657	2,257
Magdeburg	942	1,384
Merseburg	869	1,710
Erfurt	384	1,590
Schleswig	1,157	1,374
Hanover	751	1,204
Hildesheim	466	1,275
Lüneburg	356	1,748
Stade	235	1,993
Osnabrück	230	2,030
Aurich	164	1,899
Münster	879	1,776
Minden	549	1,588
Arnsberg	1,693	1,539
Kassel	843	1,363
Wiesbaden	1,625	884
Koblenz	472	1,616
Düsseldorf	3,069	1,328
Cologne	1,475	1,047
Trier *	204	2,439
Aachen	450	1,662
Sigmaringen	33	2,212
Total	30,468	1,311†

* Outside Saar.
† Average for all Prussia.

Prussia has had compulsory sickness insurance for more than half a century. The accompanying table is the result of a recent study of the distribution of physicians in Prussia.[1]

Although Prussia is smaller than most American states and there is a much more uniform distribution of population than in the United States as a whole, the differences in the distribution of physicians reach the extreme of 625 and 884 persons per physician in two provinces with the most physicians, to 3,003 and 2,651 in those with the least number of physicians in proportion to population.

Medical facilities, like all other facilities, in a competitive society, follow purchasing power; and purchasing power is not increased by any system of distribution through insurance, or otherwise.

1. Humbodt, H.: Medical Care in Prussia in the Years 1824 and 1932, Deutsches Arzteblatt **65**: 854 (Sept. 7) 1935.

Association News

RADIO BROADCASTS

The American Medical Association broadcasts over the Blue network and certain additional stations of the National Broadcasting Company at 5 p. m. eastern standard time (4 o'clock central standard time, 3 o'clock mountain time, 2 o'clock Pacific time) each Tuesday, presenting a dramatized program with incidental music under the general theme of "Medical Emergencies and How They Are Met." The title of the program is "Your Health." The program is recognizable by a musical salutation through which the voice of the announcer offers a toast: "Ladies and gentlemen, your health!" The theme of the program is repeated each week in the opening announcement, which informs the listener that the same medical knowledge and the same doctors that are mobilized for the meeting of grave medical emergencies are available in every community, day and night, for the promotion of the health of the people. Each program will include a brief talk dealing with the central theme of the individual broadcast.

The next three programs are as follows:

December 24. No broadcast.
December 31. No broadcast.
January 7. Winter Ills, Morris Fishbein, M.D.

This program is broadcast also on the short waves through KDKA, Pittsburgh, over station W8XK, 11,870 and 12,210 kilocycles.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARKANSAS

Annual Registration Due January 1.—Every licentiate of the Arkansas Eclectic Medical Examining Board must register annually with the secretary of the board between January 1 and the last day in February and pay a fee of $2, if a resident of Arkansas, and of $4, if a nonresident. The failure of a licentiate to pay the required fee by March 1 automatically suspends his right to practice while delinquent. If he fails for three successive years to pay the required fee, his license is to be canceled and thereafter will be reinstated only on such a showing to the board of moral character and professional qualifications as would entitle the applicant to the issuance of an original license and on the payment of the same fees as are required for the issuance of an original license.

CONNECTICUT

Society News.—At a meeting of the Windham County Medical Society recently, speakers included Drs. Erwin C. Miller, Worcester, Mass., and Cecil R. Garcin, Danielson, on pneumonia and cancer, respectively.——Dr. Bret Ratner, New York, addressed the Hartford Medical Society at Hartford, November 18, on allergy in childhood.

Personal.—Dr. Ross G. Harrison, Sterling professor of biology at Yale University School of Medicine, New Haven, received an honorary degree from the University of Budapest at the tercentenary celebration of the university.—Dr. Clifford D. Moore, formerly chief executive officer, Boston Psychopathic Hospital, has been appointed superintendent of the Fairfield State Hospital, Newton, succeeding Dr. Roy L. Leak.

DISTRICT OF COLUMBIA

University News.—Dr. Siegfried Thannhauser, formerly director of the medical clinic and professor of internal medicine at the University of Freiburg-i.-Br., Germany, and now of Boston, gave the second lecture in the Smith-Reed-Russell series at George Washington University School of Medicine, November 26; his subject was "Cholesterol: Its Chemical, Physiological and Clinical Aspects."

Society News.—The Medical Society of the District of Columbia was addressed, November 22, by Drs. J. Tate Mason, Seattle, and James S. McLester, Birmingham, Ala., President-Elect and President of the American Medical Association, respectively; they spoke on "Etiology and Treatment of Peptic Ulcer" and "Influence of Food in Digestive Disorders." Among others, Dr. Edward A. Cafritz addressed the society, December 11, on "Nondrainage Appendiceal Peritonitis."

ILLINOIS

Society News.—Dr. Anton J. Carlson, Chicago, discussed "Advance in Medicine Through Animal Research" before the Fulton County Medical Society in Canton, November 25.——At a meeting of the Sangamon County Medical Society in Springfield, December 5, Dr. Paul B. Magnuson, Chicago, spoke on "Surgery of Arthritis."——Dr. Jack L. Diamond, Alton, addressed the Alton Medical Society, November 14, on "Value of Malaria Therapy in the Treatment of Paresis."

Chicago

Dr. Houssay to Address Institute of Medicine.—Dr. Bernardo A. Houssay, professor of physiology, National University of Buenos Aires, Argentina, will deliver an illustrated lecture before the Institute of Medicine of Chicago, January 3, on "Interactions Between the Parathyroid Glands and the Hypophysis and Pancreas."

University News.—Construction will soon begin on a three story addition to the Surgical Institute for Crippled Children at the University of Illinois College of Medicine. The building is to cost about $150,000 and will provide forty additional beds.——A symposium on poliomyelitis was presented before the Volini Medical Society at Loyola University School of Medicine in November by Drs. Archibald L. Hoyne and Victor E. Gonda. The Volini Medical Society is an honorary society, its membership limited to those members of the junior and senior classes who have maintained honor grades in medicine.

Conference on Mental Hygiene.—The Illinois Society for Mental Hygiene sponsored a one day conference, December 6, to discuss the modern concepts and practice of mental hygiene. Speakers included:

William E. Blatz, Ph.D., associate professor of psychology, University of Toronto, Mental Hygiene Concepts in Present-Day Thought.
Marion Faber, assistant director in charge, psychiatric nursing service, Cook County School of Nursing, Psychiatric Nursing.
Dr. Franz G. Alexander, director, Institute for Psychoanalysis, Psychoanalysis.
Dr. Samuel H. Kraines, associate in neuropsychiatry, University of Illinois College of Medicine, Psychobiological Aspects.
Dr. William Malamud, professor of psychiatry, State University of Iowa College of Medicine, Iowa City, Psychotherapeutic Technics in Personality Adjustments.

Speakers at the dinner meeting included Dr. Ralph C. Hamill, who presided; Helen L. Myrick, general director of the Illinois Society for Mental Hygiene, and Dr. Clarence M. Hincks, director, National Committee for Mental Hygiene, New York.

INDIANA

Society News.—A symposium on syphilis was presented before the Indianapolis Medical Society, December 17, by Drs. John R. Thrasher, John R. Brayton, Robert G. Thayer and Russell L. Arbuckle.——The Noble County Medical Society was addressed in Kendallville, December 3, by Dr. Marshall B. Catlett, Fort Wayne, on "Surgical Treatment of Female Pelvic Disease."——At a meeting of the Fort Wayne Medical Society, December 3, Dr. Louis J. Hirschman, Detroit, discussed "Extracolonic Factors in the Etiology of So-Called Colitis."——Dr. Oscar O. Miller, Louisville, addressed the Jefferson County Medical Society in Madison, November 26, on "Modern Treatment of Pulmonary Tuberculosis."——At a meeting of the Vigo County Medical Society in Terre Haute, November 12, Dr. Walter E. Stewart, Terre Haute, spoke on sinusitis.——The Vanderburgh County Medical Society was addressed in Evansville, November 12, by Dr. Julius R. Yung, Terre Haute, on "Toxic Diffuse Goiter—Its Diagnosis and Treatment."

IOWA

Personal.—Dr. Ralph H. Heeren has been appointed associate professor of hygiene, preventive medicine and bacteriology at the State University of Iowa College of Medicine, Iowa City, succeeding Dr. Albert V. Hardy, who, it is reported, has gone to Johns Hopkins University, Baltimore.

Examination in Basic Sciences.—The Iowa Board of Examiners in the Basic Sciences will conduct a written examination at the state capitol, Des Moines, January 14, at 9 a. m. Those wishing to take the examination must first obtain an application blank from the secretary, fill it out and return it, together with the fee of $10, so as to reach the secretary not later than Monday, December 30. Edward A. Benbrook, D.V.M., Iowa State College, Ames, is secretary of the Iowa Basic Science Board.

Society News.—Dr. Julian D. Boyd, Iowa City, discussed tuberculosis in childhood before the Johnson County Medical Society at the Oakdale Sanatorium, November 6.——Speakers before the Scott County Medical Society in Davenport recently included Dr. William P. Murphy, Boston, on "Modern Treatment of Anemia."——At a meeting of the Woodbury County Medical Society in Sioux City recently Drs. William E. Ash, Council Bluffs, spoke on "Relationship of Psychiatry to General Medicine"; Eugene B. Floersch, Council Bluffs, "Coronary Thrombosis," and Lloyd G. Howard, Council Bluffs, "Head Surgery."——Dr. Lonnie A. Coffin, Farmington, was chosen president of the Southeastern Iowa Medical Society recently; speakers at the meeting included Dr. Arnold S. Jackson, Madison, Wis., on "Diseases of the Thyroid Gland."——Dr. Walter L. Bierring, Des Moines, among others, addressed the Wright County Medical Society, November 25, on the prevention of disease and the responsibility of the state health department.——Dr. Albert M. Snell, Rochester, Minn., will speak before the Linn County Medical Society, January 9, in Cedar Rapids, on "Differential Diagnosis of Conditions Associated with Jaundice."

MINNESOTA

Personal.—Dr. Fred G. Carter, superintendent of Ancker Hospital, St. Paul, has resigned to accept a position at Christ Hospital, Cincinnati; he will be succeeded by Dr. Seymour R. Lee, who formerly was on the staff of the hospital but recently has been at the state hospital at Willmar. Dr. Carter has been associated with Ancker Hospital for fifteen years.——Dr. Milburn W. Kemp of the Fergus Falls State Hospital has been appointed superintendent of the state hospital at Anoka to succeed the late Dr. Arthur C. Caine.——Dr. Thomas H. Dickson Jr. has been appointed medical director of the Minnesota Mutual Life Insurance Company to succeed Dr. Charles N. McCloud.——Dr. Magnus C. Petersen, assistant superintendent of the St. Peter state hospital since Jan. 1, 1928, has been named superintendent of the Willmar State Asylum by the Minnesota Board of Control.

MISSOURI

Medical Information Bureau.—In accordance with a decision by its house of delegates, the Missouri State Medical Association has established a medical information bureau in its office in St. Louis to facilitate the dissemination of authentic information on public health matters to the public, the press, and charitable organizations and association members, to expose and suppress quackery and to promote a better understanding between the public and organized medicine. The bureau maintains a card index file on proprietary medicines, physicians and institutions. One hundred members of the society were appointed as advisers to be consulted in answering inquiries not of a routine nature or which deal with a special field of medicine or medical problems. Dr. Edward J. Goodwin, secretary of the state association, is in charge of the bureau.

NEBRASKA

Survey of Cancer in Nebraska.—The official report of a survey of the cancer problem in Nebraska, made in 1934 by Dr. Frank L. Rector, field representative of the American Society for the Control of Cancer, at the request of the Nebraska State Medical Association, was published in the *Nebraska State Medical Journal* in November. The death rate from cancer in Nebraska was found to have increased from 75.4 per hundred thousand in 1920 to 102.5 in 1932, an increase comparable to that for the U. S. registration area as a whole. In the decade 1920-1930 the population 30 years of age and over increased only 3.7 per cent, while the cancer death rate increased 38.3 per cent. Cancer caused 11 per cent of all Nebraska deaths in 1932 and, of the 1,424 deaths, 57.2 per cent

were from cancer of the digestive tract and peritoneum. At the time of this survey seventy-five counties in Nebraska, containing 52 per cent of the population and nearly 42 per cent of the physicians of the state, were without hospitals of twenty-five beds or more. Twenty-eight hospitals located in fourteen counties furnished information concerning cancer patients cared for in 1933 and facilities for diagnosis and treatment. There were 1,355 cancer patients hospitalized in 1933; of these 184 died and eighty-two came to necropsy. Only 12.9 per cent of all cancer deaths in the state took place in hospitals. All general hospitals take cancer patients. Nine are equipped with x-ray apparatus of 200,000 volts capacity; the Lincoln General Hospital has equipment of 800,000 volts capacity. Three hospitals own a total of 256 mg. of radium, and private physicians, as far as could be ascertained, own 835 mg. Eleven of the hospitals have no facilities for laboratory examination of tissues, but four of these send tissues to pathologists of recognized standing. Six hospitals reported no necropsies, although they reported 164 deaths from all causes. Seven other hospitals reported a total of 438 deaths, of which only forty-two cases came to necropsy. Two tumor clinics were in operation in Omaha and one was being organized in Lincoln at the time of the survey. Dr. Rector outlined detailed activities that could be undertaken by the state medical association, the state department of health and the state committee of the American Society for the Control of Cancer.

NEW JERSEY

Fined for Recording Blood Pressure on Boardwalk.—Harry Forman, who operated a stand on the boardwalk at Atlantic City where he made blood pressure readings, was arraigned in district court, October 23, before Judge W. Lindley Jeffers, who fined him $200 but suspended the fine. Forman was investigated by the state medical board and the Atlantic County Medical Society after protests were received from about 175 physicians who visited Atlantic City at the annual session of the American Medical Association last June, it was said. Forman contended that he was not practicing medicine but that his machine was similar to a weight machine. The *New York State Journal of Medicine* printed in its November 15 issue a letter from the president of the Taylor Instrument Companies, Rochester, N. Y., deploring misuse of instruments produced solely for the medical profession. The letter requested that the company be given any information concerning the way these instruments are procured for unethical purposes so that steps may be taken to prevent continuance of the practice.

NEW YORK

Personal.—Dr. Louis C. Kress, director of the New York state division of cancer control, has been appointed chairman of the state cancer committee of the American Society for the Control of Cancer, succeeding Dr. Burton T. Simpson.——At the recent meeting of the New York State Association of Public Health Laboratories, a medal was presented to Mary B. Kirkbride, Sc.D., associate director of laboratories of the state department of health, in appreciation of her services as secretary of the association during the past fifteen years.——A portrait of Dr. Leroy W. Hubbard, Mount Vernon, N. Y., was presented to the Georgia Warm Springs Foundation, Warm Springs, Ga., Thanksgiving Day, by former patients. Dr. Hubbard was the first physician to be connected with the foundation, serving as surgeon-in-chief from 1926 to 1931, when he resigned to do extension work for the institution. He was succeeded at Warm Springs by Dr. Michael Hoke. Prior to this appointment, Dr. Hubbard had been orthopedic surgeon with the New York State Health Department for nine years.

New York City

Analysis of Poliomyelitis Outbreak. — The New York City Department of Health has published a preliminary report on the poliomyelitis epidemic of last summer, which reached the highest number of cases since 1931. About 1,900 cases had been reported up to October 1, compared with 4,138 in 1931 and 9,023 in 1916. The peak of the outbreak was reached August 24. Comparison with earlier outbreaks shows that there has been a definite shifting of incidence to higher ages; 86.6 per cent of the cases in 1907 were in children under 5 years old, while in 1935 only 32.8 per cent occurred in this group, with 41.9 per cent in the group 5 to 9 years old. The virulence has varied in the four principal epidemics: in 1907 the case fatality rate was estimated at 5 per cent, in 1916 it was 27.3, in 1931 it was 12.18 and in 1935 it was 4 per cent. After deliberation, it was decided to open the city schools at the regular time, and it is believed that this policy was proved sound by the fact that no increase in prevalence followed the opening of schools.

Municipal Health Building Opened. — New York's $4,550,000 ten story building for the departments of health, hospitals and sanitation, which has been under construction for four years, was dedicated November 26. Speakers included Mayor La Guardia; Dr. John L. Rice, commissioner of health; Dr. Sigismund S. Goldwater, commissioner of hospitals; Thomas W. Hammond, commissioner of sanitation; Dr. John A. Hartwell, director of the New York Academy of Medicine, and Dr. Thomas A. Gonzales, acting medical examiner. The design of the building was described as "conservatively classic," harmonizing with other civic units in the area. The main entrance is on Worth Street and the other sides face Center, Lafayette and Leonard streets. On the façades are carved names of prominent public health figures from Moses to Dr. Hermann M. Biggs. The names are Moses, Jenner, Ramazzini, Hippocrates, Paracelsus, Pinel, Lind, Koch, Behring, Pasteur, Leeuwenhoek, Ehrlich, Billings, Harvey, Farr, Howard, Lister, Nightingale, Shattuck, Morton, Marion Sims, Bard, Semmelweiss, Welch, Stephen Smith, E. B. Dalton, Biggs, Walter Reed and Gorgas. Fifty years ago the department of health was at 300 Mulberry Street; in 1889 the offices were moved to the criminal courts building, later to a building at Fifty-Fourth Street and Sixth Avenue, and then to the Excelsior Building in Center Street. From 1919 till the new building was begun the headquarters were at 505 Pearl Street and during the past four years they were at 139 Center Street.

NORTH CAROLINA

Health Bulletin Fifty Years Old.—With its December issue the *Health Bulletin* of the North Carolina State Board of Health completed fifty years of publication. It was founded by Dr. Thomas Fanning Wood, the state's first health officer, who was a practicing physician of Wilmington. Dr. George M. Cooper, assistant state health officer and director of the division of preventive medicine of the state board of health, Raleigh, has been editor since 1923.

Graduate Course in Gastro-Intestinal Diseases.—A graduate course in gastro-intestinal diseases was presented at Duke University School of Medicine, Durham, October 31-November 2. Speakers included Drs. James S. McLester, Birmingham, Ala., President, American Medical Association; Thomas R. Brown, Arthur M. Shipley, Dean Lewis and Harvey B. Stone, Baltimore; Walter C. Alvarez and Byrl R. Kirklin, Rochester, Minn.; Hugh H. Trout, Roanoke, Va.; William Weston and LeGrand Guerry, Columbia, S. C.; Walter B. Martin and Robert L. Payne, Norfolk, Va.; Martin E. Rehfuss, Philadelphia; Thomas T. Mackie, New York; Fred W. Rankin, Lexington, Ky.; Frank K. Boland, Atlanta, Ga.; Anton J. Carlson, Chicago, and John Shelton Horsley, Richmond, Va.

OKLAHOMA

County Quarantined for Meningitis.—Kiowa County was placed under quarantine December 13 because of an outbreak of meningitis that caused at least one death and thirteen illnesses in the county, which has a population of 26,000. The quarantine was lifted from most of the area two days later after a conference between the state health commissioner, Dr. Charles M. Pearce, and county authorities, but it was enforced by the national guard in the communities of Snyder and Mountain Park. Dr. James L. Adams, Hobart, Kiowa County health officer, ascribed one death definitely to meningitis and said that nine other recent deaths may have been caused by the disease. Public assemblages were forbidden and grocery and drug stores were directed to serve only by delivery and then with extreme caution.

Society News. — Dr. Ian MacKenzie addressed the Tulsa County Medical Society, Tulsa, November 11, on "Congenital Deformities." Drs. Charles H. Eads and Anna Luvern Hays spoke, November 25, on "Management of Syphilis in Pregnancy" and "Treatment of Congenital Syphilis," respectively.——The Muskogee Academy of Medicine at an all day meeting in Muskogee, December 4, had as guests Drs. Peter T. Bohan and Charles C. Dennie, Kansas City, Mo., and John C. Burch, Nashville, Tenn.——Drs. Anson L. Clark and Henry H. Turner, Oklahoma City, addressed the Osage County Medical Society, Pawhuska, recently, on "Fever Therapy: Its Possibilities and Limitations" and "Recent Advances in Endocrinology, with Special Reference to the Sex Hormones," respectively.——Drs. John L. Kleinheksel and Henry N. Tihen, Wichita, Kan., addressed the Woods-Alfalfa County Medical Society in Alva, November 26, on "Diabetes and Pregnancy" and "Relation of Gastric and Duodenal Ulcer to Cancer,"

respectively.——Drs. William P. Neilson and Charles J. Roberts, Enid, addressed the Garfield County Medical Society, Enid, recently, on "Effect of Abdominal Operations on Respiration" and "Medical Treatment of Peptic Ulcer," respectively. ——Speakers before the Kay County Medical Society, Tonkawa, recently, were Oklahoma City physicians: Drs. Ephraim Goldfain and Earl D. McBride, on arthritis, and John H. Robinson, significance of abdominal pains.

PENNSYLVANIA

Prize Awarded.—Dr. Constantine P. Faller, Harrisburg, received the 1935 award of the Seibert prize of $500 for study in Europe, given by the Harrisburg Academy of Medicine. Dr. Faller was honored in recognition of his work in initiating graduate medical assemblies in his community. The prize was presented at the academy's annual banquet, November 13.

Society News.—A conference of secretaries of county medical societies was held in Harrisburg, December 10; Dr. Samuel R. Haythorn, Pittsburgh, reported a survey of group hospitalization plans and Dr. Rosco G. Leland, director, Bureau of Medical Economics, American Medical Association, Chicago, spoke on economic problems. —— Dr. Truman G. Schnabel, Philadelphia, conducted a clinic on cardiac and renal cases at the meeting of the Cambria County Medical Society, Johnstown, December 12.

Philadelphia

Society News.—Dr. Bret Ratner, New York, addressed the Philadelphia Pediatric Society, December 10, on "Pathogenesis and Management of Allergy in Childhood."——Speakers at a meeting of the Philadelphia Academy of Surgery, December 2, were Drs. Harry E. Knox, on "Pneumococcic Peritonitis"; William J. Ryan, "Hernia of the Vermiform Appendix," and Harold A. K. Mengle, "Experimental Studies in Peritonitis." ——Drs. Lewis C. Scheffey and William J. Thudium, among others, addressed the Obstetrical Society of Philadelphia, December 5, on "Further Results in the Treatment of Carcinoma of the Cervix."——Speakers at a meeting of the Philadelphia Urological Society, November 25, were Drs. Paul M. Butterfield, New York, on "Urological Conditions in Childhood"; Joseph C. Birdsall, "Relationship of Hydronephrosis to Nephroptosis," and John T. Farrell Jr. and Theodore R. Fetter, "Irradiation of Carcinoma of the Bladder."

Pittsburgh

Society News.—At a meeting of the Pittsburgh Pediatric Society, December 13, speakers were Drs. Hyman A. Slesinger, Windber, Pa., on "Acute Epidemic Encephalitis"; James LeRoy Foster, "Present Status of Certified Milk in Pittsburgh," and William W. Briant Jr., Mount Lebanon, Pa., "Complete Heart Block in a Child of Three Years."——A symposium on peptic ulcer was presented before the Pittsburgh Academy of Medicine, December 10, by Drs. Frank A. Evans, Frederick B. Utley and John P. Griffith.

TENNESSEE

Health at Nashville. — Telegraphic reports to the U. S. Department of Commerce from eighty-six cities with a total population of 37 million for the week ended December 7 indicate that the highest mortality rate (20.8) appears for Nashville and that the rate for the group of cities was 12.2. The mortality rate for Nashville for the corresponding week of 1934 was 16.5 and for the group of cities, 11.7 The annual rate for the eighty-six cities for the forty-nine weeks of 1935 was 11.3, and the same rate appeared for the corresponding period of last year. Caution should be used in the interpretation of these weekly figures, as they fluctuate widely. The fact that some cities are hospital centers for large areas outside the city limits or that they have large Negro populations may tend to increase the death rate.

TEXAS

Personal. — Dr. Edmond H. Sauvignet, Laredo, has been appointed health officer of Webb County, succeeding Dr. Albert T. Cook, who became health officer of the city of Laredo.—— Dr. Laurence J. Montague has been appointed superintendent of City-County Hospital, Edinburg, succeeding Dr. Cleburne M. Williamson, who resigned to devote himself to private practice.

Graduate Assembly at Houston.—The fourth annual Post Graduate Medical Assembly of South Texas was held in Houston, December 3-5, at the Rice Hotel. Sessions were held morning, afternoon and evening, with informal luncheon meetings as well. Guest speakers were: Drs. Edward V. L. Brown, Chicago, and Edward C. Ellett, Memphis, Tenn., on ophthalmologic subjects; Thomas E. Carmody, Denver, and Albert C. Furstenberg, Ann Arbor, Mich., on otolaryngology; William C. Danforth, Evanston, Ill., obstetrics; Wilburt C. Davison, Durham, N. C., pediatrics; Walter A. Fansler, Minneapolis, proctology; Louis J. Karnosh, Cleveland, psychiatry; Frank H. Lahey, Boston, surgery; Oswald S. Lowsley, New York, urology; John S. Lundy, Rochester, Minn., anesthesia; Emil Novak, Baltimore, gynecology; Paul A. O'Leary, Rochester, Minn., dermatology; Leroy Sante, St. Louis, radiology; Cyrus C. Sturgis, Ann Arbor, Mich., internal medicine, and Philip D. Wilson, New York, orthopedics. The eye, ear, nose and throat section of the assembly met jointly with the Texas Ophthalmological and Otolaryngological Society with Drs. Carmody, Brown, Furstenberg and Ellett as guests.

GENERAL

Examinations in Ophthalmology.—The American Board of Ophthalmology will conduct examinations in Kansas City, Mo., May 11, at the time of the annual session of the American Medical Association and in New York in October. Applications and case reports must be filed sixty days before the date of examination with Dr. Thomas D. Allen, assistant secretary, 122 South Michigan Avenue, Chicago.

International Conference on Fever Therapy.—The first International Conference on Fever Therapy will be held in New York in September 1936. Therapeutic, physiologic and pathologic phases of fever will be discussed. It is planned to translate abstracts of all the papers into French, English and German. In order to make printed copies of the transactions available for the conference, it is necessary that manuscripts and abstracts be sent in not later than June 1, 1936. Those interested in participating are requested to make early application. Dr. William Bierman, 471 Park Avenue, New York, is secretary. The members of the American committee are Drs. Arthur U. Desjardins, Rochester, Minn.; William Bierman, New York; Frank W. Hartman, Detroit; Leland E. Hinsie, New York; Clarence A. Neymann, Chicago; Walter M. Simpson, Dayton, Ohio, and Stafford L. Warren, Rochester, N. Y.

Journal on Birth Control.—A periodical known as the *Journal of Contraception* appeared in November. Published by the Birth Control Clinical Research Bureau, New York, it is to be devoted to the "biological and clinical aspects of human fertility and its control" and contains one original article, editorials, abstracts of current literature and news. The following medical advisory board is announced: Calvin Bridges, Ph.D., Pasadena, Calif.; Robert Chambers, Ph.D., New York; Norman E. Hines, Ph.D., Hamilton, N. Y.; H. M. Parshley, Sc.D., Northampton, Mass., and Drs. Morris J. Baskin, Denver; Adelaide Brown, San Francisco; Herbert M. Evans, Berkeley, Calif.; Alan F. Guttmacher, Baltimore; James S. Klumpp, Huntington, W. Va.; Adolf Meyer, Baltimore; James Shirley Sweeney, Dallas, Texas; Fred J. Taussig, St. Louis; Ira S. Wile, New York, and Prentiss Willson, Washington, D. C.

Society News.—The annual meeting of the American Society for the Study of Arthritis was held in New York at the Waldorf-Astoria, December 12-14. Among speakers were Drs. Walter S. Barnhart, Ottawa, Canada, on "Some Problems of Chronic Rheumatic Diseases"; Raymond L. Jeffery, Seattle, "Treatment of Arthritis with Complement Fixing Reactions"; Conrad Berens, New York, "Lesions of the Eye Associated with Arthritis," and Donald Gordon, New York, "Traction and Resisted Movements in Arthritis." The program of the annual open meeting was noted in THE JOURNAL, December 14, page 1995.——Dr. George L. Wright, Syracuse, N. Y., was elected president of the International Association of Fire and Police Surgeons and Medical Directors of Civil Service Commissions at the annual session in New York, November 23. Dr. Karl B. Bretzfelder, New Haven, was made vice president and Dr. Arthur Wildman, Brooklyn, secretary. Next year's convention will be in New Haven.

Prevalence of Communicable Disease. — A decrease in poliomyelitis of about 1,500 cases occurred during the four weeks ended November 2 as compared with the preceding four weeks, according to *Public Health Reports*. The 1,039 cases for the country as a whole was about 50 per cent in excess of those for the corresponding periods in 1934 and 1933, but it was only about half of the number reported for this period in each of the years 1931 and 1930. The incidence was still considerably above that of recent years in regions along the Atlantic coast where the disease has been most prevalent, but all other sections reported fewer cases than last year. The number of cases of meningococcic meningitis rose from 240 for the pre-

ceding period to a total of 273 for the four weeks period ended November 2. The increase was somewhat unexpected, because this disease is usually at or near its lowest level at this season of the year. The sharpest rise occurred in the South Atlantic region, where practically every state reported an increase over the preceding four weeks and the fifty-nine cases reported was the highest for this period in the seven years for which data are available. The incidence of typhoid continued to decline. For the four weeks ended November 2 there were 1,600 cases, the lowest figure for this period in recent years. The usual seasonal increase of diphtheria continued, with 5,416 cases reported during the four weeks analyzed.

Mr. Fosdick Appointed President of Rockefeller Foundation.—The retirement of Max Mason, Ph.D., president of the Rockefeller Foundation since 1929, and the appointment of Raymond B. Fosdick, New York, as his successor, have been announced by the foundation, effective July 1, 1936. Mr. Mason, who will devote his time to research in mathematics and mathematical physics, left Wisconsin in 1925 to become president of the University of Chicago, from where he went to the foundation in 1928 as director of the division of natural sciences, and became president in 1929. In addition to becoming head of the foundation, Mr. Fosdick will assume the presidency of the General Education Board. In explanation of the combination of offices, it was announced that the General Education Board plans to expend increasing amounts of its principal funds over a period of years, possibly resulting in their complete exhaustion; meanwhile, to avoid any overlapping of the boards, it was deemed wise to have one administration for the two. Mr. Fosdick, an attorney, has been identified with Rockefeller interests for many years, being a trustee of the organizations he now heads and of the Rockefeller Institute for Medical Research. In 1913 he made a study of police organization in Europe as a representative of the Rockefeller Bureau of Social Hygiene. Among other public positions, Mr. Fosdick has been assistant corporation counsel of New York (1908-1910), commissioner of accounts in charge of investigations of city departments (1910-1913), and a member of the New York City board of education. During the World War he served as chairman of a commission on training camp activities of the War and Navy departments, as a special representative of the War Department in France, as civilian aide to General Pershing in France, and in 1919-1920 was attached to the League of Nations. He was awarded the Distinguished Service Medal.

Government Services

Hospitals and Physicians Eligible for Loans Under Federal Housing Administration

Hospitals and similar institutions, whether owned and operated by individuals or corporations, are eligible for loans for modernization, repair and equipment under the Modernization Credit Plan of the Federal Housing Administration.

Physicians and surgeons who maintain their offices in buildings removed from their homes, as well as those who have their offices in dwellings, may also take advantage of the plan to have the most modern establishment and equipment.

The distinction is that the hospital, diagnostic center, or the office of the physician when it is not located in a dwelling, may obtain credit, anywhere from a few hundred dollars to as much as $50,000, while the physician is limited to a loan of $2,000 when his office is a part of a home.

The office in a business building, where frequently a number of physicians have their individual consultation rooms but use a common diagnostic center and equipment, would be eligible for credit on the same basis as a hospital. The office in a home, however, would be limited to the $2,000 maximum for modernization and repair as provided for homes.

This means briefly that any reputable institution or physician may obtain on easy terms sufficient credit to put the structure in good condition and to purchase and install the most modern equipment for diagnosis and treatment.

The Federal Housing Administration lends no money. The loans are made by private banking and financial institutions under an arrangement by which the Housing Administration insures them against loss.

Under these conditions, lending institutions are more than willing to make loans that are sound business risks.

The terms are that the charge may not be in excess of the equivalent of a $5 discount for each $100 face value of a one-year monthly instalment note. Payments are to be divided into equal monthly instalments and may be spread over a period of as long as five years.

Equipment that would be considered eligible for an insured credit is described in the regulations as follows:

"It must be of permanent, utilitarian character and of such value as to justify the application of the principle of time payment thereto. It may not include furnishings, furniture, or small portable appliances. A hospital, for instance, could obtain an eligible loan covering x-ray machine, thermal cabinets, fluoroscopes and articles of like character, but such a loan could not include surgical instruments, beds and other furniture."

This should give an understanding of the types of equipment that may be installed. The list is an elaborate one. The main consideration is that the article should have a unit value sufficient to justify the application of time payments to its purchase and should be of a durable nature with a reasonable expectancy of useful life longer than the period of the loan.

The dealer in all such equipment is in all probability familiar with the eligibility rulings of the administrator and whether the article he sells comes within the regulations adopted. If he cannot supply the information, the Federal Housing Administration, Washington, D. C., will make rulings on request.

In the same manner in which equipment has outgrown its usefulness, the building itself may be in need of repairs and modernization. One of the greatest essentials in a hospital is proper light. Lighting installations are eligible.

The operating room may be completely done over, the walls redone, a modern heating plant installed and ventilating or air conditioning equipment put in. The structure may be in need of a new roof, floors, glass-enclosed porches, concrete driveways, fireproofing (most important in an institution of this kind), a built-in garage, or a separate garage. It may be advisable to make some additions. In short, any structural improvements that may be done to the ordinary business establishment would be eligible for the hospital.

Since funds are advanced by banks or other private lending agencies, they are expected to exercise ordinary business precaution. Naturally a lending institution could not be expected to make a large loan to some institution when the credit rating did not justify it.

The banks are required to satisfy themselves on the question of security and the ability to repay.

Assuming these conditions to be satisfactory, there should not be the slightest difficulty in obtaining credit promptly.

Here is an illustration from Hartford, Conn.: Miss Anna M. Holmquist, owner of a convalescent home, obtained a modernization credit of $1,500 and transformed the institution into an up-to-date maternity hospital. The loan was made available within five days from the date of application. This enabled the owner to put on a new roof, new porch, copper drains and new heating system, and to modernize the interior and the operating room.

It is amazing how much may be done with a comparatively small sum, particularly in the modernization of the building and the purchase of equipment. It would be well for the physician who maintains his own hospital, clinic or diagnostic center, or the group of physicians or corporations, to make a survey of their needs and either consult their banker or the Federal Housing Administration.

Extent of Rural Health Service

Public Health Reports announces the establishment of full time health service in twenty-four units during the period Jan. 1-Dec. 31, 1934. The service was discontinued in fourteen units, leaving a net gain of ten. The greatest gains were in Tennessee and North Carolina, in each of which full time health service was established in five counties. Delaware and Maryland lead in the percentage of rural population with this service, all of their counties having been provided with full time local health organizations. Health units in Delaware are provided by the state, while those in Maryland are maintained by the local governments, with or without assistance from the state health department or other sources. Of the 540 counties, townships or districts with health service under full time health officers at the end of the present calendar year, 507, or 93.9 per cent, were receiving financial assistance for the support of their health service from one or more of the following agencies: state board of health, U. S. Public Health Service, the Rockefeller Foundation, the American Red Cross, the American Women's Hospital Fund, the Rosenwald Fund, the Commonwealth Fund and the Milbank Memorial Fund.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov. 23, 1935.

Antivivisection Hospital Abandons Its Program

For many years there has been an active antivivisection party in this country, which carries on propaganda by means of a journal, public meetings and in other ways. One is the maintenance of the National Antivivisection Hospital at Battersea (in Southwest London). This is a general hospital with a proper staff of physicians, surgeons and specialists. According to its constitution no vivisectionist was permitted to be a member of the board of the hospital or of its medical, surgical, nursing or administrative staff. No remedies that were the result of any vivisection or experiments on animals might be used there. Every person on the staff was required before joining to give a pledge against vivisection. It has now proved impossible to carry on the hospital under these conditions. In 1929 there was a large surplus of income over expenditure, but since then there has been a deficiency, particularly in the income from legacies. The hospital has had to close three wards of 100 beds. An application was therefore made to obtain the sanction of the high court of justice for abandoning the antivivisection conditions of the foundation of the charity. An affidavit, made by the senior honorary surgeon, was read, to the effect that in view of the advances in general medical knowledge it was impossible to run the hospital on the present antivivisection lines. No other hospital in England was run on antivivisection lines. A scheme was submitted to the court for power to change the name of the hospital to the Battersea General Hospital and to declare that the observance of the principles and practice of antivivisection were no longer to bind the hospital. Mr. Justice Eve said that he must approve the scheme. Though personally he sympathized with the original objects and principles of the hospital, the time had come when they were no longer practicable. Possibly the diminution of the hospital's income was due to the fact that everybody had now to pay so much in taxation that little was left for charity.

An Expensive Dermatitis

The judicial committee of the privy council (the supreme court of appeal in England for the dominions) allowed the appeal of Dr. R. T. Grant of Adelaide, South Australia, from a judgment of the high court of Australia, which allowed by a majority the appeal of the Australian Knitting Mills Ltd. from a judgment of the Supreme Court of South Australia by which it was held that Dr. Grant should recover damages amounting to $12,250 for dermatitis contracted from the underwear manufactured by the knitting mills. Dr. Grant's claim was that the disease was contracted by reason of the presence of free sulfite in the cuffs or ankle ends of the pants that he purchased and wore, and that the presence of this substance was due to the negligence of the manufacturers. He put on the pants June 28, 1931, in the morning and by the evening felt itching on the ankles, but objective symptoms did not occur until next day, when redness appeared on each ankle. The condition got worse and he was confined to bed from July 21 for seventeen weeks. The rash became generalized and very acute. In November he became convalescent and went to New Zealand to recuperate. He returned in February and was able to resume his practice but soon had a relapse, and by March his condition was so serious that he went to the hospital for three months. For the respondents it had been argued that the disease might have been contracted from some external irritant, which implied no imperfection in the garments and did harm only because of the doctor's peculiar susceptibility. Thus the disease might have been initiated by the mechanical irritation of the wool itself, or, if it was due to some chemical ingredient in the garment, that might have been something in itself harmless, so that the mischief was attributable to the appellant's own physical defect. It was argued that the respondents could not be held responsible for anything in the garments that would not be harmful in normal use. However, the Australian chief justice held that the doctor's skin was normal. The respondent's secretary gave evidence that they had sold throughout Australia 4¾ millions of garments treated by a similar process and had had no complaints. Their lordships' judgment was that the facts showed negligence in manufacture. According to the evidence, the process of manufacture was correct. The danger of excess of sulfites being left was recognized and guarded against. If they were left, some one was at fault. The appellant was not required to show who this was. Their lordships allowed the appeal with costs in all the courts. This probably means more than doubling the $12,250 damages. The retailers as well as the manufacturer were made liable.

The Eradication of Rabies from England

Rabies was eradicated from England about forty years ago by an order for the compulsory muzzling of dogs for a period. This prevented communication of the disease by any dog that happened to be in the incubation stage. The effect has been maintained by the quarantine of all imported dogs for a time which exceeds the incubation period. Though rabies is prevalent on the continent of Europe, these measures have kept England free from it, with one limited exception. In 1918 an outbreak occurred in Devon and Cornwall owing to an infected dog having been smuggled into the country. It took three years to weed out this outbreak. Since 1921 there has been no confirmed case of rabies among the dogs of this country, though since 1919 twelve cases have occurred in imported dogs while undergoing quarantine. The vigilance that is exercised with regard to the importation of dogs is shown by the recent case of a woman traveling from Berlin and landing at Croydon airport carrying a very small dog known as a German pinscher. The dog was placed in quarantine, but she was fined $10 because she had not obeyed the regulation which requires any person bringing a dog to obtain a landing license. The maximum penalty for the offense is $250, and she was let off with the much smaller fine because the magistrate was satisfied that she did not break the law deliberately. She knew that the dog would have to be quarantined and thought that this was all that was necessary.

Damages for Shock

The extent to which damages can be claimed for shock are surprising. It has been decided in the law courts that illness resulting from nervous shock may be the immediate consequence of a wrongful act and that there may be cause of action against the person responsible although he never could have expected such a result. The following is an example: A woman was told, by way of a practical joke, that her husband, who had been to some races, had had an accident and broken both his legs. She was asked to fetch him home in a carriage and to take some pillows with her. The shock of this fabrication caused a serious illness and she was awarded $500 damages. It has even been decided that a person can claim damages for shock because he was the spectator of an accident. A woman was awarded $50 for shock to her nerves which prevented her from performing her household duties, so that she had to employ outside help. The shock was caused by seeing an omnibus mount the curb and slightly injure a man. A few years ago the court of appeal ordered a new trial of an action in which a jury gave a verdict against a plaintiff who claimed damages for

shock. One of the judges remarked that the branch of the law relating to shock had developed considerably in recent years. A similar development has taken place with regard to the compensation of workmen for injury arising in or out of their employment. A man became ill in consequence of being stung by an insect on his way to work. He was awarded compensation for this as an injury arising out of his employment.

Modernization of Hospital for Nervous Diseases

The National Hospital for Nervous Diseases, Queen Square, London, may be described as both the birthplace and the home of British neurology. It was there that its great men—Hughlings Jackson, Ferrier, Gowers and others—worked. It has 186 beds and also maintains a convalescent home of thirty-two beds at East Finchley. Its activities have been hampered for several years because of lack of accommodations. The modernization of the hospital and the provision of new buildings and equipment would cost $900,000. The Rockefeller Foundation has offered $600,000 on the condition that the remainder required for the improvements is raised within two years. A further $300,000 would be given by the Rockefeller Foundation as an endowment for research work at the hospital, which is claimed to be the leading center of the world for neurology. Probably more neurologists have been trained there than at any other similar institution. Men from all parts of the world, and particularly from America, come there for training.

PARIS

(From Our Regular Correspondent)

Nov. 8, 1935.

Results of Compulsory Antidiphtheria Vaccination

An interesting report has just been published by Reh in the *Revue d'immunologie* on the results of the vaccination of school children at Geneva with the Ramon anatoxin. In a population of 160,000 there are about 25,000 children attending the public schools. Reh cites an instructive example of the value of such a method. Three children of the same family, aged respectively 6 months, 3 years and 4 years, were admitted to a crèche. The youngest was placed in a ward of nonvaccinated infants, the two others in wards in upper stories of the crèche, containing children of about their own age. In spite of a negative certificate of having any contagious disease, the three children were diphtheria carriers. An epidemic of diphtheria followed the admission of the 6 months old infant to the ward of nonvaccinated infants of the same age. All the nonvaccinated nurses in this ward also were victims. In the other two wards, to which the 3 and 4 year old children had been admitted, the children had been previously vaccinated. In spite of being in constant contact with the two carriers, these vaccinated children did not acquire the disease.

From February 1929 to December 1934 a total of 11,150 school children have been vaccinated; 8,953 were given three and 1,436, two injections of the Ramon anatoxin. The former received 15 and the latter 20 antigen units. Postvaccinal reactions of mild local character occurred in 123 and a febrile reaction in 294 cases. The results of the compulsory vaccination of school children in the canton of Geneva is evident by a comparison of the number of cases of diphtheria in that canton with the total number in all of the cantons of Switzerland:

1929:	286	in Geneva versus	3,723	for all Switzerland
1930:	131	in Geneva versus	4,545	for all Switzerland
1931:	130	in Geneva versus	2,641	for all Switzerland
1932:	133	in Geneva versus	2,265	for all Switzerland
1933:	80	in Geneva versus	2,271	for all Switzerland
1934:	25	in Geneva versus	1,775	for all Switzerland

The decreased morbidity is especially applicable to children of school age, who constitute the majority of vaccinated persons. Sixty-four cases of diphtheria were observed at the schools of Geneva in 1931, forty-five in 1932, twenty-five in 1933 and only thirteen in 1934.

The influence of vaccination on the death rate from diphtheria is even more striking. Since 1929 there has not been a single death among vaccinated children. Among the 11,150 vaccinated children there were fifty-one cases of diphtheria. It is necessary, however, to exclude fifty children with nondiphtheritic sore throat, who were carriers but were reported as having diphtheria. In children with a negative Schick reaction it is impossible to distinguish in vaccinated children between a true diphtheria and an ordinary sore throat developing in carriers. The investigations of Dopter (*Bull. Acad. de méd.* **112**:801 [Dec. 18] 1934) have made it possible from both an immunologic as well as clinical standpoint to confirm the existence of nonspecific sore throat in children with a negative Schick reaction but who are diphtheria bacillus carriers.

Included in these fifty cases occurring in vaccinated children are three of rhinitis with rapid recovery and forty-seven pharyngitis cases, of which forty-three were of benign appearance, four with false membranes and only one with severe general symptoms. All the forty-seven children recovered. Evidently there was inadequate immunization in spite of three anatoxin injections in the four cases of false membrane.

Cancer of the Cervix After Subtotal Hysterectomy

Mme. Simone Laborde and two of her assistants at the Cancer Institute of Paris reported their observations on the frequency of cancer of the cervix following subtotal hysterectomy at the July 1 meeting of the Gynecologic and Obstetric Society. They studied 1,508 cancers of the uterus from 1921 to 1935, including 1,165 of the cervix, fourteen of the body, one sarcoma, 101 vaginal recurrences following complete hysterectomy for cancer, forty-four pelvic recurrences of various kinds, and fifty-seven cancers of the cervix after subtotal hysterectomy. The percentage of the latter to those of cancer of the cervix in general is 4.9. One should not speak of cancer of the cervical stump following subtotal hysterectomy in cases in which such a cancer is only a stage in the development of a uterine cancer. In other words, a relatively long period must have elapsed between the subtotal hysterectomy and the appearance of the cervical neoplasm.

It has been customary to state that, if cancer appears within a year after the subtotal hysterectomy, it already existed at the time the operation was performed. It is impossible to know the real condition of the cervix in women who do not present themselves for examination when the first symptoms are noticed. Furthermore, certain endocervical cancers develop in such a latent manner that many months may elapse before they give rise to symptoms. Delayed appearance does not always signify a "healthy interval." In the fifty-seven cases of cervical cancer after subtotal hysterectomy observed by Laborde, eighteen appeared "early," four without any "healthy interval" and fourteen after an interval of from one to six months. The "late" cases appeared after an interval of from one to twenty years, as follows: three after one year, five after three years, five after four years, one after five years, one after six years, two after seven years, five after eight years, one after ten years, two after eleven years, two after twelve years, one after fourteen years, four after seventeen years and two after twenty years. These last two intervals are the longest ever reported. Only thirty-nine, or 3.36 per cent, of the fifty-seven cases ought to be considered as true cancers of the cervix developing late enough after the subtotal hysterectomy; i. e., to be independent of an overlooked cancer at the time of operation. The majority of cancers developing in the cervical stump develop from the vaginal epithelial covering. When a glandular type is found,

one must always suspect that the lesion termed "fibroma" for which the subtotal operation was done in reality was a cancer of the body with extension into the cervix. This is especially true of the cases in which the cervical cancer appears without any "healthy interval." In spite of this suspicion, Laborde has encountered three "late" cases of the glandular type in women who had been operated on for fibroids two, three and four years, respectively, before. In such instances there must have been an independent development of cancer from the endocervical glands.

The prognosis of cancer developing in a cervical stump is not as favorable as that of cancer developing in the normal cervix, because invasion of the bladder and pelvic cellular tissue occurs relatively early. The treatment that has generally been employed at the Cancer Institute is radium, associated or not with high voltage roentgen therapy. Radium is difficult to use, because the fornices of the vagina are obliterated and the cervical canal is too short as a rule. Twenty of the fifty-seven patients were given radium treatment alone and thirty-two both radium and high voltage roentgen therapy. One patient has been cured for eleven years, one for seven years, and one for five years. Two others are in good condition after two and one after one year. All the others died within a year after being first examined; hence the prognosis is much less favorable than in cases of cervical cancer in which there has been no subtotal hysterectomy. As to development of a cancer in the vaginal scar following complete hysterectomy for noncancerous lesions only nine, or 0.68 per cent, such cases were observed by Laborde, in a total of 1,305 cancers of the uterus (1,165 cervical and 140 of the body).

Prof. Gustave Roussy Promoted in Legion of Honor

In the recent list of promotions of the minister of national education appears the name of Prof. Gustave Roussy, dean of the Faculty of Medicine of Paris and director of the anticancer center of the Paris region. Professor Roussy has rendered distinguished service to medicine in France and amply merits his promotion to be a commander in the Legion of Honor.

BERLIN

(From Our Regular Correspondent)

Oct. 21, 1935.

Fiftieth Anniversary of the German Gynecologic Society

In October the Deutsche Gesellschaft für Gynäkologie held a session in Munich to celebrate the fiftieth anniversary of its founding. After the society was founded in Strasbourg, which was then a German city, its first congress was held in Munich under the chairmanship of Professor von Winckel. The history of this society has been closely associated with the development of gynecology as a specialty. As Prof. A. Mayer of Tübingen, chairman of the society, in an article in the *Münchener medizinische Wochenschrift* wrote, the specialty of gynecology in Germany is an offshoot of "surgery," which was grafted on "obstetrics." This combination gave rise to certain difficulties in the development of the new specialty. Young obstetricians had to learn surgery, whereas in other countries experienced surgeons became gynecologists. The result was that "operative gynecology" in Germany was possibly inferior to that of some foreign countries; but this applies only to the first years of the new development. Gynecology therefore in its early years was characterized by a surgical trend. It sought to develop within the realm of so-called greater gynecology. Soon "minor gynecology," so called, sprang up in opposition to greater or major gynecology. Minor gynecology became interested in the ills that affect woman and was not confined chiefly to the diseases of certain organs. After women ceased to confine their activities to the home and the care of a family and had entered professional and industrial life, new problems arose for gynecology, and the connections with other closely related specialties became more numerous. The conception of gynecology as comprising the biology and pathology of womankind arose. From "frauenheilkunde," or the art and science of medicine as applied to women, there developed "frauenkunde," or the knowledge of womankind from a wide range of view. Thus, gynecology has developed from a specialty dealing chiefly with the diseases of the female organs into a specialty that embraces the whole personality of woman as an individual creation and a significant member of society.

Meeting of the German Lay Practitioners

The tendency under the present régime in Germany to promote the cause of the so-called heilpraktiker, or the nature-cure practitioners, has been frequently mentioned in recent letters. The "Heilpraktikerbund Deutschlands, Reichsverband in München" held recently in Frankfort-on-Main a session to which all the district leaders of the reich and the directors of the professional schools of the league were invited. About 200 representatives attended. This league was created in 1933 by the federal ministry of the interior and was assigned the task of cleansing the league, which consisted of twenty-three former associations of heilpraktiker and numbered 5,700 members, of all unsavory elements. The league is endeavoring to perform the task assigned to it and, it is asserted, has launched a bitter fight against quackery. From 1,500 to 2,000 former heilpraktiker have already been eliminated, and the management of the league has stated that about 1,500 more members will be removed. Those members thus eliminated are for the most part heilpraktiker who have refused to appear before a commission of the aforementioned league and submit to an examination as to their knowledge of the theory and practice of the principles of healing advocated by the league. To what extent these heilpraktiker differ from quacks, in a scientific and medical sense, is not clear. In any event, the opposition of licensed physicians to these lay practitioners is great. On the other hand, the heilpraktiker are endeavoring to do all in their power to prove to the government authorities, who are well disposed toward them, the serious nature of their activities. It is of interest that the director of the league, a government appointee, spoke at this meeting on "The Interests of the Heilpraktiker Profession"; the director of the federal professional school of the league discussed the continuation courses to be given next winter, and the leader of the press and propaganda presented the aims and tasks of the propaganda of the league. It is evident that the heilpraktiker will exert themselves to the utmost to gain the same rank and prestige enjoyed by regularly licensed physicians.

The Value of Revaccination Against Smallpox

Dr. Breger of the federal bureau of health has given an opinion on the value of revaccination against smallpox, which was presented by the president of the federal bureau of health at the session of the international bureau of health, held in Paris in May 1935. This question has again come to the fore because the director of the vaccination service in the region of Rio de Janeiro recently expressed the view that a single vaccination confers a lifelong immunity against smallpox and that a reduction of immunity is so rare that it is of no practical importance; revaccination, he contended, has no value and is superfluous. He asserted further that the many good results from revaccination reported in German statistics are for the most part immunity reactions that have been erroneously considered as evidence of successful revaccination. In view of these facts, revaccination in Rio de Janeiro had been almost entirely given up and no untoward conditions had resulted.

Dr. Breger stated that German experience over a long period of years went to show that a single vaccination in childhood does not suffice to protect a population against a smallpox epidemic. As an illustration he cited the fact that in Bavaria the vaccination of children was introduced in 1807 but did not eradicate smallpox from that region. However, after the federal vaccination law went into effect in 1874, which prescribed revaccination, deaths from smallpox (aside from the first few years after the law went into effect) have rarely occurred. Practical experience has therefore shown that the primary vaccination is not sufficient and that a renewal of immunity through revaccination is needed if an effective protection against the spread of smallpox epidemic is to be secured. This example can be confirmed by numerous observations during more recent years in Czechoslovakia, Hungary, Rumania, Poland, Latvia, Soviet Russia and other countries.

The duration of vaccination immunity has been placed by an English commission at from nine to ten years, on an average. It was the opinion of this commission that vaccination immunity must be renewed from time to time in order to reach the highest degree of protection. The German vaccination commission reached the same conclusion; it also recommended a revaccination ten years after the first vaccination. The most convincing documentary evidence for the duration of vaccination immunity is furnished by the English smallpox statistics of the previous decade, because, owing to the peculiar nature of the English vaccination service, different groups of the population may be distinguished with respect to vaccination. In 1926, for example, younger persons, following a single vaccination, developed smallpox after twelve years at the earliest. In revaccinated persons it was found that in the 1-30 years group only one case of smallpox developed, and that was in a person aged 15. It appeared that after about ten years from the date of the first vaccination and after about twenty years from the revaccination a sure immunity was no longer present. It is evident, therefore, that a lifelong vaccination immunity does not exist. England's experience is in harmony with numerous observations made in Germany. Following an epidemic of smallpox in 1917, it was ascertained that 79 per cent of all deaths from smallpox concerned persons who had passed their fortieth year. Strictly speaking, a revaccination should therefore be applied every ten years. Since that is not feasible, emergency vaccinations are given in the event of a smallpox outbreak. In Germany the reaction following revaccination is termed positive if nodules or vesication appears at the site of the vaccinal incision; this is not, however, solely an immunity reaction. On the basis of epidemiologic observations, it appears advisable to hold fast to revaccination as the backbone of smallpox vaccination.

Control in the Bandage Trade

Between the organization of the German pharmacists and of the manufacturers of bandage supplies an agreement has been reached that is designed to insure to pharmacies an adequate supply of suitable bandages needed by the krankenkassen, including the special packages intended for the use of puerperants. A special committee will test the products of the bandage manufacturers as to quality and priceworthiness. If the products of which samples are furnished to the testing commission meet the requirements, the manufacturer of bandage supplies is entitled to furnish to the pharmacies his products in an accepted package. Every package must bear the emblem of the Deutsche Apothekerschaft together with the mark of the federal guild of the manufacturers of bandage supplies; a stamp showing the contents (quality and weight); the key number of the dealer, and, finally, this "Notice": "Tested as to quality and priceworthiness by the Deutsche Apothekerschaft and the Reichsfachschaft der Verbandmittelhersteller."

BELGIUM

(From Our Regular Correspondent)

Oct. 29, 1935.

First International Congress of Gastro-Enterology

The first International Congress of Gastro-Enterology was held in Brussels under the chairmanship of Dr. Jean Schoemaeker of The Hague. Bringing together for the first time the internists, surgeons, radiologists and biochemists, whose researches dealt chiefly with the pathology of the digestive tract, it was a complete success. Twenty-three countries were represented. While the congress was in session, the officers of the congress, united in a general assembly with the delegates of twenty-one nations, laid the foundations for an international society of gastro-enterology, which, after the manner of the International Society of Surgery, will constitute a closed group.

GASTRITIS

The etiology, symptoms, diagnosis, treatment, radiologic aspects and pathology of gastritis were discussed. Konjetzny pointed out that the question of the indications for the surgical treatment of gastritis is far from being solved. In acute gastroduodenitis, with or without erosion, internal treatment is indicated. At present the diagnosis may be established with certainty. In chronic gastritis the indications for gastric resection are partially established. The radical operation is necessary for (1) circumscribed hypertrophies of the areolar or polypous mucosa, in which the presence of cancer may be chemically suspected, and (2) various forms of hypertrophic stenosis of the pylorus, a disorder that is, in most cases, the result of a chronic gastritis. It need occasion no surprise if the results of a gastric resection are unsatisfactory, owing to an acute or subacute gastroduodenitis.

ULCERATIVE COLITIS OF NONAMEBIC ORIGIN

Donati described the treatment to be followed in grave ulcerative colitis of nonamebic origin. The condition, while resistant to medical treatment, is susceptible of surgical intervention, if applied early. Surgical treatment is indicated also in the various complications and sequels of colitis. Two kinds of intervention are to be considered: (1) indirect, for the eradication of foci assumed to be or shown to be the cause of the colitis; such foci may involve the mouth and the teeth, the stomach and the duodenum, the appendix, the colon, the rectum, the peritoneum, the gallbladder, the uterus and the adnexa, and the urinary organs, and (2) direct, on the colon itself. These interventions may take on different forms: (*a*) enterostomy; intestinal fistula to effect lavage of the colon, or artificial anus for the total exclusion of the diseased intestine and the withdrawal of fecal matter; (*b*) anastomosis and intestinal exclusion; ileosigmoidostomy, ileotransversotomy, typhlosigmoidostomy, and (*c*) resection of the colon (partial colectomy); total colectomy is inadmissible. The operative technic does not involve any special rules; the indications are the most important problem.

Training of African Natives as Medical Aids

The colonial administration of the Belgian Congo has undertaken to create schools in which the natives may be trained as aids to nurses, aids to midwives, "sanitary guards" and nurses.

The program as announced shows how much thought has been given to the organization of this work, and excellent results from these efforts may be anticipated. The program of instruction for the aids to nurses, which requires the least preparation, may be outlined as follows:

Points covered by the theoretical course: (1) moral responsibilities and duties of a nurse's aid; explanation of laws and regulations concerning medical service; (2) preparation of brief case reports based on cards and bulletins in current use in the

hospitals and dispensaries and in traveling services in vogue in Africa; (3) microscopy as applied to tropical pathology; (4) practical ideas on hygiene as applied to the ward services of a hospital, to dispensary services, and to centers of treatment; individual hygiene; hygiene of villages, work-camps and work-yards; ideas concerning contagion and prophylaxis; (5) care and use of the equipment of wards, dispensaries, centers of treatment and traveling services; ideas concerning cleanliness, asepsis and antisepsis; scales, weights and measures, and (6) ideas concerning the principal disorders treated in traveling services and on the more important tropical endemic diseases; preparation of solutions, and instruction in the use of specific drugs.

Points covered by the practical course: (1) rendering of aid in hospital services, in consultation centers, in the dispensary and in the centers of treatment; (2) microscopy; (3) transport of patients and wounded persons; first aid in emergency cases; management of stretcher service; (4) dressings, and (5) minor operations and interventions in hospital and in traveling services.

Prof. Léon Frédéricq

In the death of Prof. Léon Frédéricq, whose career covered more than half a century in experimental physiology, Belgium has suffered a severe loss. Born in Ghent in 1851, Léon Frédéricq completed in that city his doctorate in the natural sciences and in medicine in 1871. After working in several laboratories in foreign countries, he served as an assistant in physiology and comparative anatomy at the University of Ghent. During this period he proved the existence of fibrinogen in the blood plasma. Later, when Schwann, eminent proponent of the cellular theory, was casting about for some one for the chair of physiology at the University of Liége, his choice was Léon Frédéricq, then 30 years old. From 1879 on, for forty years, Léon Frédéricq distinguished himself by his clear and concise presentation, which drew about him young collaborators who shared their teacher's enthusiasm for laboratory research. In this favorable atmosphere he founded what amounted to a school of biology, whereby he gave a transcendent impetus to the experimental sciences and became one of the leading physiologists of his time. His researches dealt chiefly with the physiology of the circulation, respiration and the nervous system. He demonstrated that the respiratory movements are dependent on a medullary center the action of which is conditioned by the carbon dioxide content of the human blood. In 1928 he was chosen president of the Academy of Medicine.

CZECHOSLOVAKIA

(From Our Regular Correspondent)

Nov. 5, 1935.

Intussusception in Infants

In a recent issue of *Rozhledy v chirurgii a gynaekologii* (1935, No. 3, p. 340) Polák made a report on fourteen cases in which the diagnosis of intestinal invagination was made. In twelve cases the diagnosis was confirmed. Surgical treatment was employed in eleven of these cases and one was cured without operation. Three patients who were operated on did not recover. The others did, and the condition did not recur. In two cases the diagnosis was not confirmed by the operation. Early diagnosis is necessary for the success of any therapy. Ombrédanne's law is valid for nearly all cases. Blood in the discharges as well as a palpable tumor occurs, however, only in advanced stages of the illness. The earliest and most frequent signs of intussusception are sudden abdominal pains of intermittent character with vomiting. This must always arouse suspicion of invagination, even if other symptoms are missing. As, however, diagnosis based merely on these symptoms can never be complete and justify surgical treatment, one should in these early stages make a roentgen examination immediately and try medical treatment, operating only if this should fail. In cases in which hemorrhage has occurred and there is a tangible tumor, the diagnosis is usually clear and a roentgenogram is unnecessary, immediate operation being called for. Operation is done under ether anesthesia through a pararectus or by a middle abdominal incision above the navel. Spinal anesthesia also is recommended. Disinvagination is most frequently effected by expression of the intussusceptum, a careful pull on the invaginated bowel being sometimes necessary. To prevent recurrence, Ombrédanne's ileocecopexis was used several times; but for cases that have a tendency to recur, the method of Coubine and Steinclenger is recommended; it consists in the suture of the serosa of part of the ileum to the cecum. Should disinvagination be too difficult, Brown's operative method is recommended, consisting in incision of the neck of the invagination, disinvagination and suture of the enterostomic wound. If gangrene has occurred, Maunsel's operation is preferred to resection of the invagination, which is too severe for infants.

Surgical Complications of Diabetes and Treatment

Siška (p. 362) reports on the results of treatment of 105 cases of surgical diabetes. The death rate was 18.09 per cent. The author believes that surgical complications of diabetes occur less frequently in women than in men. Five of these patients suffered from furunculosis, thirty-eight from abscess and carbuncles, and twenty-nine from gangrene of the limbs. In thirty-four cases, diabetes complicated other diseases, such as acute and chronic appendicitis, incarcerated hernia, varices, hemorrhoids and fractures. Much stress is laid on preparation of the patient before the operation as well as on good nursing. Great importance is attached to the collaboration of the internist, on whose instructions the result of the operation often depends. Various modes of anesthesia are discussed. Intermittent anesthesia with ethyl chloride is regarded as most suitable, the acidity after the operation being thus considerably reduced; in addition, the patient is spared the psychic shock.

Operation for Pancreatic Cysts

In the same issue Rolák and Gjurić describe a case of pancreatic cyst, which developed after resection of the stomach according to the method of Péan and Rydigier, probably as a result of the ligature of a pancreatic duct during operation. After the marsupialization of the cyst a fistula developed, which resisted treatment for three years. The cyst contained all three pancreatic ferments. Comparison of the pancreatic secretion in the duodenum and in the fistula, and the effect of different food on the pancreatic secretion, showed that secretion was stimulated most by hydrocarbon; then came ether, fat and albumin. Milk had the least effect. As the fistula did not close, a pancreatogastrostomy was performed according to Jedlička's technic. The literature describes various modifications of this treatment of pancreatic cysts used in about twelve cases with good results.

Professor Fiessinger's Lecture

Prof. Dr. Noel Fiessinger of Paris lectured in Prague, November 4, on parenchymatosis during cirrhosis of the liver. If the liver, kidney or another organ is the site of a chronic inflammation, there first appear the destruction of the parenchyma and a sclerosis of the mesenchyme. Professor Fiessinger discussed the relation of mesenchymatitis and parenchymatosis during the illness. Clinically only the total aspect of their action is observed. The physician has to analyze the case to find what may be reparable, and which symptoms result from the parenchymatous degeneration. The curing of a sclerotic organ does not mean the curing of the sclerotic tissue. Sclerosis is due to a scar and it cannot be cured. Besides the scar, the physician has to keep in mind the reaction of the organ, or what Professor Fiessinger calls "sécondaire."

Deaths

During the last two months, Czechoslavakian medicine has lost three leading personalities:

Prof. Dr. Anthony Hanák, aged 46, chief of the physiologic institute of Carl's University in Prague, died September 12. Professor Hanák studied the hemodynamic effects of absorption and secretion of capillary walls, completely overthrowing the Pflüger dogma. For a year he studied hematology in Barcroft's laboratory in Cambridge. In 1925 he organized the physiologic institute in Bratislava, and since 1930 he had been chief of the physiologic institute in Prague.

October 1, Prof. Dr. Charles Výmola, chief of the laryngologic and otologic department of the policlinic in Prague, died at the age of 72.

On the eve of his fiftieth birthday, Dr. Procházka, professor of neurology and psychiatry of Masaryk's University in Brno, was shot by a former patient. He was very popular and was president of the Moravian Medical Chamber (Association).

RIO DE JANEIRO

(From Our Regular Correspondent)

Oct. 15, 1935.

Electrocardiographic Changes in Myocardial Infarct

Dr. Jairo Ramos, in a lecture before the Associaçaõ Paulista de Medicina, discussed the electrocardiographic changes due to myocardial infarct. He reviewed the experiments of Smith, in which the electrocardiographic changes found in myocardial infarct were interpreted like those caused by ligation of the coronary branches. The diagnosis of myocardial infarct by the electrocardiogram was first made in 1918 by Pardee and was based on Smith's work. The speaker illustrated his lecture by showing a collection of electrocardiograms.

Serum Albumin and Blood Globulin in Liver Diseases

Dr. Joaõ Manoel Rossi, in a lecture before the Associaçaõ Paulista de Medicina, discussed the rôle of the liver in the formation of blood proteins, especially serum albumin and globulin. Blood proteins, according to the speaker, are formed by the liver. Experiments proved that blood proteins are well regenerated in animals with normal liver functions, slowly regenerated in animals with a slight injury of the liver due to the administration of chloroform, and not regenerated at all after hepatectomy. The speaker wondered whether the determination of the serum albumin and globulins in the blood could be a test for liver insufficiency. From observations in 100 cases he reached the following conclusions: The content of serum albumin and globulin in the blood, alone, is not of diagnostic and prognostic value. The serum albumin-globulin ratio cannot be considered as a test for liver insufficiency. However, it is of great prognostic value for the general condition of the patient not only in liver diseases but in several other diseases. The progressive falling of the coefficient, on the one hand, indicates that the patient is near death. Its increase, on the other, indicates an open improvement of the patient toward recovery.

Methylene Blue in the Treatment of Leprosy

Dr. Renato Braga, in a lecture recently delivered before the Sociedade Paulista de Leprologia, claimed priority in the administration of methylene blue in the treatment of leprosy, which he used earlier than did Dr. Feliz Guisard. He treated lepers, in the Asilo Colonia St. Angelo and in Taubaté, with methylene blue, associated with chaulmoogra oil, in 1916. He treated 122 lepers with methylene blue, according to Montel's technic, that is, injections of increasing doses of from 10 to 45 cc. of a 1 per cent solution of methylene blue in doubly distilled water. In some cases the results were better than those obtained by the chaulmoogra oil treatment. The speaker advised the use of methylene blue in the diagnosis of leprosy; leprotic lesions, even when only slightly visible, are colored by the stain. He reported satisfactory results from the administration of methylene blue, associated with sodium salicylate, in the treatment of leprosy of the painful form and discussed the results of intra-arterial injections of methylene blue in leprosy of the atrophic and ulcerous form.

Pan-American Conference of Mental Hygiene

The first Pan-American Conference on Mental Hygiene will be held in the near future in Rio de Janeiro under the auspices of Brazil and with the collaboration of some other South American countries. It is hoped that all countries in North, Central and South America will send delegations. The following topics will be discussed: social and hospital care of neuropsychiatric patients; prevention of organic diseases of the nervous system; prevention of alcoholism; forensic psychopathology and psychology; prevention of delinquency; psychoanalysis; psychotechnic and mental hygiene in work; mental hygiene and education; sexology in mental hygiene; organization and propaganda of mental hygiene; eugenics.

MOSCOW

(From Our Regular Correspondent)

Oct. 31, 1935.

A Solarium at the Extreme North

The arctic department of the Leningrad Institute of Physical Therapy studied this year the influence of the arctic climate on man. On the Imandra shore of lake Imandra (latitude 67° 41′) an aerosolarium was established, which provided more than 1,000 sun and air baths. Next year there will be built a special enclosed solarium for air baths. Preliminary studies indicate that aeroheliotherapy in extremely northern latitudes has great curative value because of the marked biologic activity of the northern air and sun. For this purpose the institute plans to build sanatoriums and health resorts in many districts of the Kola peninsula.

The Health Resort Conference

The seventh All-Union Conference of Health Resorts and Spas will be held in Moscow, December 25. The previous conference was called eight years ago. The subjects for discussion at the conference will be Health Resorts of the Soviet Union, Curative Gaseous Spas and Treatment of Children's Diseases at Health Resorts; a scientific exhibit will show the natural resources of Russian health resorts.

Ultra Short Wave Therapy

The All-Union Institute of Experimental Medicine is studying ultra short wave therapy. The greatest difficulties in this problem are the dosage of the waves and correct indications for their use. It is not accurately known what quantity of the energy produced is utilized by the organism under treatment. Ultra short waves produce a vasoconstriction. They are effective therefore only when the blood vessels have not lost their ability to contract because of organic changes such as those that cause gangrene. The ultra short waves have a bactericidal action and thus promote simultaneously the immune properties of the organism. They are effective in the treatment of furunculosis, carbuncles and other local and general inflammations. Even peritonitis of gynecologic origin, in its most acute stages, responds to this method of treatment.

The warmth effect of ultra short waves is used for the treatment of neuritis and neuralgia. The waves were found beneficial in chronic neurodermatitis with cutaneous itching, which ceased after irradiation of certain parts of the central nervous system and not of the itching part. However, it is too soon to use ultra short radio wave generators because possible

dangers must be studied in laboratories and scientific institutes, and the medical and technical staffs must be instructed in their use.

Prof. Michael P. Tuchnov

Prof. Michael P. Tuchnov died in Moscow, September 19, at the age of 56, from angina pectoris. As the result of his scientific work on immunology, he was elected professor of pathologic physiology at Kazan. In 1930 he went to Leningrad and Moscow, where he worked in the All-Union Agricultural Academy, in the Kremlin's Laboratories and in other scientific establishments. In his thirty-three years of scientific activity, Professor Tuchnov made investigations also in the fields of bacteriology and biology.

The Aspirant Groups

The increasing number of medical schools and the necessity for highly specialized scientists has led the People's Commissariat for Health to consider the question of organizing aspirant groups in medical institutes. Physicians up to 35 years of age can be enrolled in the aspirant group after they pass examinations in special medical courses, foreign languages and the natural sciences. This course of study is for a three-year period. The first year and a half is devoted to theoretical science related to the specialty taken at the institute. After examinations in practical and theoretical courses, the aspirants pass the second one and one-half years in clinical study. After his thesis has been accepted, the aspirant receives the degree of medical science candidate, if the Supreme Qualification Committee of the People's Commissariat of Health approves him. The Aspirant Institute must help to supplement deficiencies in highly qualified specialists. After graduation their number in the different medical specialties will be markedly increased.

New Ambulatorium in Moscow

In October a new polyclinic for workers in heavy industry was opened in Moscow. It is situated in a building specially reconstructed to serve 2,000 patients a day. The walls of the x-ray room are covered with lead packing. This polyclinic is one of the best Moscow ambulatoriums, and the most famous specialists receive patients there.

Marriages

JOHN C. ADAMS, Surg. Lieut. Commander, U. S. Navy, to Miss Lucene Prestwood, both of Pensacola, Fla., September 17.

HENRY TOMPKINS KIRBY-SMITH, Sewanee, Tenn., to Miss Mary Phillips Woolverton of Birmingham, Ala., September 21.

HAROLD L. BRERETON, Emmetsburg, Iowa, to Miss Margaretta Williamson of Washington, D. C., in Chicago, October 16.

ORLANDO BENEDICT MAYER to Miss Nancy Phillips, both of Columbia, S. C., at Blowing Rock, N. C., September 11.

MAXWELL G. SIMPSON, Elizabeth, N. J., to Mrs. Lillian Haver Miller of Southern Pines, N. C., September 12.

CHARLES SUMMERS STEVENSON, Baltimore, to Miss Alice de Guildry Stevens of New Haven, Conn., September 21.

HENRIK MARINUS ROZENDAAL, Rochester, Minn., to Miss Katherine Scranton of Scranton, Pa., October 19.

PATRICK H. W. MURPHY, Jersey City, N. J., to Miss Marion B. Breen of Douglas, Ont., Canada, August 14.

CLARENCE LEE GUYTON JR., Monroe, N. C., to Miss Jennie Llewellyn Finlayson in Cheraw, October 26.

NICHOLAS GOTTEN, Philadelphia, to Miss Mary Meredith Whittaker of Memphis, Tenn., November 6.

HARRY P. BLABER JR., Toi Shan, China, to Miss Constance White of Naugatuck, Conn., November 27.

FRANK TRUMBO HARPER, Jamestown, N. C., to Miss Gladys Virginia Duval of Greenville, September 3.

JETHRO MERIWETHER HURT to Miss Margaret Virginia Bennett, both of Blackstone, Va., November 6.

RALPH JORDAN MITCHELL, San Francisco, to Miss Olga Verlaque of Lexington, Ky., in October.

GEORGE O. A. KELLOGG to Miss Emma D. Jensma, both of Nampa, Idaho, in Boise, September 27.

CLARENCE HUNT WHITE, Burnsville, N. C., to Miss Mary Young Hunt of Henderson, October 24.

WILLIAM A. DOWER, Windsor, Conn., to Miss Mary G. Church of West Hartford, October 14.

HILLIS LEDBETTER SEAY, Sanatorium, N. C., to Miss Margaret Vanstory of Lincolnton, September 2.

ERNEST H. DENGLER, Pottstown, Pa., to Miss Irma Arleen Greenawalt of Reading, November 2.

VACLAV GEORGE DVORAK, Chicago, to DR. ELLA HELEN VALENTA of Cicero, Ill., October 30.

JOHN F. JUDGE to Miss Helen Englehart, both of Newark, N. J., in East Orange, November 8.

HARRY G. HUDNALL to Miss Elizabeth Beaufort Revercomb, both of Covington, Va., October 5.

LEWIS W. CELLIO, Youngstown, Ohio, to Miss Dorothy Dowling of St. Louis, October 26.

RAYBURN NELSON JOYNER to Miss Olive Marie Rigdon, both of Jacksonville, Fla., November 7.

PAUL F. WILLWERTH to Miss Margaret Mathews, both of Binghamton, N. Y., September 5.

HAROLD A. FLETCHER, San Francisco, to Mrs. Virgil M. Hillyer at Baltimore, October 25.

EDWIN E. DAY to Miss Gertrude Douglas, both of Vancouver, B. C., Canada, October 5.

WILLIAM GROSSMANN JR., Richmond, Va., to Miss Virginia Cox of Lynchburg, November 3.

JOHN LINCOLN HOWETH, Jersey City, N. J., to Miss Edith Sloane Tompkins, September 28.

BOYD HARDEN, Pittsburgh, to Miss Ruth Elizabeth Holmes of McKeesport, Pa., October 26.

LOUTEN RHODES HEDGPETH, Lumberton, N. C., to Miss Louise Hogan of Hamlet, November 7.

FRANKLIN LEDGERWOOD GEIGER to Miss Beatrice Ott, both of Columbia, S. C., September 23.

GRACE M. JORDAN to Mr. Earl Scranton Duvall, both of Columbus, Ohio, November 9.

CECIL A. ROBINSON to Dr. LILA ROSE ROBERSON, both of Gladewater, Texas, October 6.

EDWARD O. GUERRANT, Winchester, Ky., to Miss Julia Bullard of Anniston, Ala., October 15.

PAUL R. MAULDEN, Kannapolis, N. C., to Miss Julia Watson of Greensboro, September 18.

CLAUDE MERRILL LEISTER to Miss Mary S. Butz, both of Allentown, Pa., November 9.

ROBERT H. CROW, Woodruff, S. C., to Miss Juanita Gregory of Spartanburg, November 4.

THOMAS STANLEY MEADE to Miss Mary Belle Long, both of Richmond, Va., November 7.

LOUIS EARL WHARTON to Miss Mabelle Lorenz, both of Akron, Ohio, November 2.

EDWARD DE WITT COOK, Buffalo, to Miss Emily Smith of Montclair, N. J., October 5.

WILLIAM E. ELKIN, Atlanta, Ga., to Miss Nell Osborne of Louisville, Ky., October 22.

WILLIAM E. E. TYSON to Mrs. Charles Franklin Patterson, both of Detroit, October 7.

PAUL JONES CHAMBERS to Miss Mary Ellen Watts, both of Charlotte, N. C., recently.

JOHN A. BOONE, Boston, to Miss Ellen Gleason of Bedford County, Va., October 19.

ALBERT S. HARDEN JR., Maplewood, N. J., to Miss Helen Baer Coxe, October 12.

REUBEN J. GUEST, Fort Payne, Ala., to Miss Janie Chapman of Tuscaloosa, recently.

DAVID E. JONES, Indianapolis, to Miss Dorothea Barnett of Winamac, October 6.

DAVID MERRILL WEEKS to Miss Ruth Gould, both of New York, September 21.

CHARLES H. FARMER to Mrs. Eugenia Spivey, both of Macon, Ga., in September.

HOWARD CHARLES CLARK to Miss Vera May, both of Wichita, Kan., October 5.

JOSEPH CARL BAIER, Williamsport, Pa., to Miss Lois Winters, October 26.

Deaths

Charles Louis Mix, Americus, Ga.; Harvard University Medical School, Boston, 1894; member of the House of Delegates of the American Medical Association, 1906-1907; past president of the Chicago Neurological Society; professor emeritus since 1929 and from 1920 to 1929 professor of medicine and head of the department, Loyola University School of Medicine, Chicago; professor of anatomy, Northwestern University Woman's Medical School in 1899 and the dental school in 1901; assistant professor of anatomy, 1900-1903, professor of physical diagnosis, 1903 to 1914, and clinical professor of medicine from 1914 to 1920, Northwestern University Medical School; served during the World War; lieutenant colonel in the medical reserve corps from 1919 to 1929; for many years on the staff of the Mercy Hospital, Chicago, and consulting internist to the Illinois Central Railroad Company; was associated with Dr. John B. Murphy in editing *Surgical Clinics of North America* and was editor-in-chief of the "Practical Medical Series"; aged 65; died, November 21, of pneumonia.

John Leonard Eckel ✠ Buffalo; University of Buffalo School of Medicine, 1907; chairman of the Section on Nervous and Mental Diseases of the American Medical Association, 1928-1929; associate professor of neurology and assistant professor of psychiatry at his alma mater; member of the American Neurological Association, the American Psychiatric Association, the Association for Research in Nervous and Mental Disease and the Central Neuropsychiatric Association; served on the medical advisory board during the World War; attending and consulting neurologist to the J. N. Adam Memorial Hospital, Perrysburg, Buffalo General Hospital, Millard Fillmore Hospital, Memorial Hospital, Mercy Hospital, Our Lady of Victory Hospital, Sisters Hospital and the Providence Retreat; author of many articles on research published in medical journals; aged 55; died, November 26, of coronary occlusion and myocarditis.

Raymond J. Wenker, Milwaukee; Marquette University School of Medicine, Milwaukee, 1914; also a dentist; member of the Associated Anesthetists of the United States and Canada; formerly professor of dental anatomy and operative technics, professor of orthodontia and instructor of orthodontia technic, professor of oral surgery and temporary dean, Milwaukee Medical College Dental Department; professor of oral surgery, orthodontia, dental anatomy and operative technics and dean, College of Wisconsin Physicians and Surgeons Dental Department, assistant in nose and throat clinic at his alma mater and professor of orthodontia and associate professor of oral surgery at the Marquette University Dental Department; aged 67; died, October 24, of coronary thrombosis, arteriosclerosis and hypertension.

Herbert Francis Twitchell, Portland, Maine; Medical School of Maine, Portland, 1883; past president and member of the Maine Medical Association; past president of the Cumberland County Medical Society; at one time instructor in clinical surgery at his alma mater; fellow of the American College of Surgeons; consultant to the Maine Eye and Ear Infirmary, Maine General Hospital and the Children's Hospital, Portland, the Webber Hospital, Biddeford, and the Bath (Maine) City Hospital; aged 76; died, November 24, of cerebral hemorrhage and arteriosclerosis.

L. Rosa Hirschmann Gantt ✠ Spartanburg, S. C.; Medical College of the State of South Carolina, Charleston, 1901; past president of the Medical Women's National Association; medical examiner of a draft board during the World War, member of the district advisory board, acting surgeon of the U. S. Public Health Service; at various times on the staff of St. Luke's Hospital, Tryon, and the Spartanburg General Hospital; aged 59; died, November 16, in a hospital at Philadelphia, of embolism following an abdominal operation.

Charles Daniel Fox, Ardmore, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1903; Medico-Chirurgical College of Philadelphia, 1906; served during the World War; at one time demonstrator of neurohistology and neuropathology, instructor in neurology and pediatrics, Hahnemann Medical College and Hospital of Philadelphia; formerly on the staff of the Children's Homeopathic Hospital; aged 55; died, October 24, of carcinoma of the liver and lung.

Frederick Bush Willard, Buffalo; University of Buffalo School of Medicine, 1890; member of the Medical Society of the State of New York; at one time instructor in anatomy at his alma mater; served during the World War; formerly medical sanitary inspector with the board of health; aged 72; died, November 7, in the Buffalo City Hospital, of cerebral arteriosclerosis, cerebral hemorrhage and bronchopneumonia.

Leonard Wheeler, Worcester, Mass.; Harvard University Medical School, Boston, 1870; member and former vice president of the Massachusetts Medical Society; trustee, past president of the board and formerly on the staff of the Memorial Hospital; at one time trustee of the State Hospital, Foxboro; at various times on the staffs of the City Hospital and St. Vincent Hospital; aged 90; died, October 2, of pneumonia.

Arthur Rowley Reynolds ✠ Chicago; Bellevue Hospital Medical College, New York, 1876; health commissioner of Chicago from 1893 to 1895 and again from 1897 to 1905; in 1911 named a lieutenant and in 1917 a captain in the medical reserve corps of the army; aged 81; died, November 14, in the Augustana Hospital, of injuries received when he was struck by an automobile.

Eugene Robert Van Meter, Springfield, Mo.; Washington University School of Medicine, St. Louis, 1905; member of the Missouri State Medical Association; formerly assistant in clinical laryngology and rhinology at his alma mater; served during the World War; aged 52; died, September 30, in St. John's Hospital, of fat embolism, following a fracture of both legs.

William Francis Metcalf, Bayfield, Ont., Canada; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1888; fellow of the American College of Surgeons; formerly clinical professor of gynecology, Detroit College of Medicine; at one time on the staff of the Harper Hospital, Detroit; aged 71; died, October 17.

Olaf Severin Leedahl, Stanley, N. D.; Minneapolis College of Physicians and Surgeons, medical department of Hamline University, 1907; member of the North Dakota State Medical Association; county coroner; formerly county health officer; aged 54; died, October 28, of carcinoma of the stomach.

August Angelo Cavagnaro, Stockton, Calif.; Keokuk Medical College, College of Physicians and Surgeons, 1908; also a pharmacist; formerly city health officer and member of the state legislature; aged 59; died suddenly, October 15, of acute dilatation of the heart and chronic nephritis.

Hubert Schoonmaker ✠ Clifton Springs, N. Y.; University of the City of New York Medical Department, 1891; fellow of the American College of Physicians; at one time superintendent of the Clifton Springs Sanitarium and Clinic; aged 72; died, October 21, of carcinoma of the lung.

George Collister, Boise, Idaho; Homeopathic Hospital College, Cleveland, 1880; member of the Idaho State Medical Association; on the staffs of St. Luke's and St. Alphonsus hospitals; formerly member of the city council, and city and county physician; aged 79; died, October 18.

Charles Edmund Fisher, Toledo, Ohio; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1895; fellow of the American College of Surgeons; for many years on the staff of St. Vincent's Hospital; aged 67; died, October 19, of coronary thrombosis.

Robert Hugh Campbell ✠ Vader, Wash.; College of Physicians and Surgeons, Boston, 1906; past president of the Lewis County Medical Society; formerly member of the school board and bank president; aged 65; died, October 20, as the result of a cerebral hemorrhage.

Oscar E. Underwood, Roseboro, N. C.; University College of Medicine, Richmond, 1909; member of the Medical Society of the State of North Carolina; aged 50; died, September 15, in the Highsmith Hospital, Fayetteville, of diabetes mellitus and carcinoma of the stomach.

James E. McGillicuddy ✠ Lansing, Mich.; Detroit College of Medicine, 1898; past president of the Ingham County Medical Society; on the staffs of St. Lawrence Hospital and the Edward W. Sparrow Hospital; aged 63; died, October 17, of bronchopneumonia.

Joseph Herbert Ackerman, Asbury Park, N. J.; Hahnemann Medical College and Hospital of Philadelphia, 1899; member of the Medical Society of New Jersey; on the staff of the Fitkin Memorial Hospital, Neptune; aged 65; died, November 2.

Roderic Stephen Elliott, Waupaca, Wis.; Milwaukee Medical College, 1900; member of the State Medical Society of Wisconsin; served during the World War; aged 60; died suddenly, October 19, in Fort Francis, Ont., Canada, of heart disease.

James Jerome Parsons ✠ Monrovia, Calif.; Syracuse University College of Medicine, 1913; member of the Associated

Anesthetists of the United States and Canada; served with the British army during the World War; aged 51; died in October.

Paul Hardtmayer Walter, Bethlehem, Pa.; Jefferson Medical College of Philadelphia, 1913; member of the Medical Society of the State of Pennsylvania; aged 48; was killed, November 16, when his automobile collided with a trolley car.

Peter Lansing Wheeler, San Francisco; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1866; aged 91; died, October 2, in the Merritt Hospital, Oakland, of pneumonia, as the result of a fall.

Benjamin W. Brown ✠ Charlotte, N. C.; University of Virginia Department of Medicine, Charlottesville, 1886; senior surgeon in the U. S. Public Health Service; aged 74; died, October 25, of carcinoma of the prostate.

Alice Hamilton Ward, Bloomfield, N. J.; Woman's Medical College of the New York Infirmary for Women and Children, 1890; aged 70; died, November 15, in the Community Hospital, Montclair, of heart disease.

Joseph Charles Buckley, Bay St. Louis, Miss.; Tulane University of Louisiana Medical Department, New Orleans, 1910; served during the World War; aged 47; died, October 27, of cerebral hemorrhage.

Jean Baptiste Masse, Lawrence, Mass.; School of Medicine and Surgery of Montreal, Que., Canada, 1902; member of the Massachusetts Medical Society; aged 59; died suddenly, October 16, of heart disease.

Newman Hall Dewis Cox, Baltimore; Baltimore University School of Medicine, 1895; University of Maryland School of Medicine, Baltimore, 1902; aged 67; died, October 17, in Richmond, Va.

James H. Leary, Rush, N. Y.; University of Buffalo School of Medicine, 1897; member of the Medical Society of the State of New York; died, October 21, of carcinoma of the colon and myocarditis.

Daniel David Coffey, Chicago; University of Maryland School of Medicine, Baltimore, 1903; for many years manager of the Chicago State Hospital; aged 55; died, November 22, of myocarditis.

Cornelius Breckinridge Boyle, Libby, Mont.; Columbian University Medical Department, Washington, D. C., 1891; aged 71; died, October 3, in the Libby General Hospital, of cerebral hemorrhage.

H. Nelson Amidon Jr., Painesville, Ohio; Western Reserve University Medical Department, Cleveland, 1884; formerly county coroner; aged 72; died, October 13, of gastritis and senility.

Powhatan P. Trueheart, Sterling, Kan.; Hospital College of Medicine, Louisville, Ky., 1876; member of the Kansas Medical Society; aged 84; died, October 26, of bronchopneumonia.

James Gostanian, Detroit; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1899; served during the World War; aged 63; died, October 17, of cerebral hemorrhage.

Charles Everett Banker, New York; Columbia University College of Physicians and Surgeons, New York, 1896; aged 70; died, November 24, of angina pectoris and coronary thrombosis.

Edgar Hart Ellis, Nutley, N. J.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1885; aged 76; died, October 10, of carcinoma of the prostate.

Edward Y. Walker, Eatonton, Ga.; College of Physicians and Surgeons, Baltimore, 1881; aged 78; died, November 5, in a hospital at Atlanta, of arteriosclerosis and hemiplegia.

Garner Forseman Parker, Pocahontas, Iowa; Hahnemann Medical College and Hospital, Chicago, 1912; aged 49; died, September 28, of x-ray burns received several years ago.

John Duncan Stewart ✠ Hartford, Mich.; Detroit College of Medicine, 1905; served during the World War; aged 56; died, October 3, in the Borgess Hospital, Kalamazoo.

Frank Wilbur Cornwell, Plainfield, N. J.; New York Homeopathic Medical College, 1900; aged 58; died, October 14, in Los Angeles, of a self inflicted bullet wound.

George Randolph Morse, Saskatoon, Sask., Canada; Dalhousie University Faculty of Medicine, Halifax, 1902; aged 60; died, August 5, of cerebral hemorrhage.

Eugene Florencio Raphel, Cumberland, Md.; University of Maryland School of Medicine, Baltimore, 1906; aged 57; died, October 30, of cirrhosis of the liver.

Edward E. Conrad, New York; Chaddock School of Medicine, Quincy, Ill., 1889; aged 67; died, November 7, in the Memorial Hospital, of adenocarcinoma.

Horace Newell Williams ✠ Providence, R. I.; Bellevue Hospital Medical College, New York, 1882; aged 74; died, November 20, of cerebral hemorrhage.

Olin A. Snyder, Schoharie, N. Y.; Eclectic Medical College of the City of New York, 1879; aged 85; died, October 22, of chronic nephritis and myocarditis.

Victor Gregory Foley, Milwaukee; Marquette University School of Medicine, Milwaukee, 1915; aged 43; died, October 18, of carcinoma of the colon.

Charles F. Cluthe, Evansville, Ind.; Medical College of Ohio, Cincinnati, 1891; aged 66; died, October 11, in St. Petersburg, Fla., of angina pectoris.

Vladimir Alexis Shlanta, Olyphant, Pa.; Medico-Chirurgical College of Philadelphia, 1916; aged 42; died suddenly, October 15, of heart disease.

John Said Perekhan ✠ Chicago; Rush Medical College, Chicago, 1888; aged 68; died, November 22, in a local hospital, of carcinoma of the stomach.

Dexter Horatio Hadley, Pittsford, Mich.; Northwestern Medical College, St. Joseph, Mo., 1890; aged 83; died, October 10, of cerebral hemorrhage.

Manley Holland Russell, Star City, Ark. (licensed in Arkansas in 1903); member of the Arkansas Medical Society; aged 62; died, October 25.

William L. McGavic, Cave City, Ky.; Keokuk (Iowa) Medical College, College of Physicians and Surgeons, 1900; aged 92; died, October 5.

Carl E. Willan, Trafalgar, Ind.; Medical College of Ohio, Cincinnati, 1897; aged 63; died, October 1, of cerebral hemorrhage and acute nephritis.

Marion X. Corbin, Savannah, Ga.; University of the City of New York Medical Department, 1891; aged 69; died, September 29.

Madison G. Baldwin, Riverside, Calif.; Toledo (Ohio) Medical College, 1896; aged 63; died, October 13, of coronary thrombosis.

Daniel W. Bradfield, Wildersville, Tenn. (licensed in Tennessee in 1902); aged 84; died, October 29, of bronchopneumonia.

William Walter King, Milnor, N. D.; Miami Medical College, Cincinnati, 1893; aged 66; died, October 4, of pneumonia.

Glenn Robert Keholm, Omaha; Creighton University School of Medicine, Omaha, 1935; aged 26; died, September 28.

Walter Pope Pillans, Raymondville, Texas; Missouri Medical College, St. Louis, 1886; aged 70; died in September.

Oliver W. Foxworthy ✠ Leon, Iowa; College of Physicians and Surgeons, Keokuk, Iowa, 1884; aged 80; died, October 18.

Samuel Dryden Snow, North Conway, N. H.; Dartmouth Medical School, Hanover, 1897; aged 62; died, September 19.

Harry E. Koons, Philadelphia; Southern Homeopathic Medical College, Baltimore, 1897; aged 63; died, October 26.

William Frank Rhodes, Capleville, Tenn.; Memphis Hospital Medical College, 1907; aged 61; died, September 25.

John T. Wages, Macon, Ga.; Chattanooga (Tenn.) Medical College, 1899; aged 59; died, October 6, at Indian Springs.

George H. Musekamp, Cheviot, Ohio; Medical College of Ohio, Cincinnati, 1884; aged 71; died, September 2.

Benjamin Abbott Bradley, Hamlet, Ohio; Pulte Medical College, Cincinnati, 1882; aged 78; died, October 5.

Alfred Jefferson ✠ Omaha; Omaha Medical College, 1900; aged 65; died, October 19, of coronary thrombosis.

James Richard Smith, Cleveland; Medical College of Ohio, Cincinnati, 1907; aged 57; died, September 21.

James Henry Kennedy, Pinola, Miss.; Gate City Medical College, Dallas, Texas, 1905; died in October.

Oston Melton, Laconia, Ind.; Louisville (Ky.) Medical College, 1881; aged 84; died, September 16.

Frank S. Byington, Los Angeles; Louisville (Ky.) Medical College, 1896; aged 66; died, December 3.

William C. Schwier, Knox, Ind.; Louisville (Ky.) Medical College, 1892; aged 67; died, September 22.

Thomas B. Hutto, Damascus, Ark. (licensed in Arkansas in 1903); aged 55; died, September 23.

Correspondence

SHORT WAVE DIATHERMY

To the Editor:—In THE JOURNAL, April 6, page 1237, a preliminary report on short wave diathermy by Krusen, published under the auspices of the Council on Physical Therapy, calls attention to the lack of data concerning the biologic effects of the new method and the imperfections and fire hazards of its apparatus. In the time elapsed since, the status of the therapeutic aspects of short wave diathermy has not changed, while the multiplicity of new apparatus and accessories has increased its potential hazards rather than diminished them. The following case may serve as an illustration:

In a woman patient two brand new pliable rubber pad electrodes were applied laterally to the neck, opposite each other without the interposition of any material between the skin and the rubber insulation covering of the metal condenser plates. As soon as the electrical energy from a fifteen meter short wave apparatus was turned on, the patient cried out that she was getting burned. The apparatus was shut off immediately and under one electrode a carbonized area of the size of a silver dollar was found. Examination of the electrode revealed that the metal plate inside the rubber covering was not in the center but had slid down. It was covered only by a thin edge of rubber, and as soon as the electric energy was turned on arcing occurred from the metal plate to the skin; this melted the thin rubber covering instantly and inflicted a painful burn, which took several weeks to heal. There was no way for the physician to learn of the defective rubber insulation of the electrode beforehand, which the manufacturer, when called to task, acknowledged.

In addition to this case at least two others were seen in which accidental contact of the electrode cables with each other or with metal furnishings caused melting of the rubber covering and the sudden appearance of flames, frightening and burning the patient. I also know of cases in which there were burns due to overheating under the electrodes.

In administering short waves with the present apparatus, dosage is based entirely on the unreliable factor of subjective sensation of the patient, whereas in ordinary diathermy the meter reading keeps dosage at a safe maximum and enables its duplication at subsequent treatments. Questions of deeper and more uniform heat penetration and its desirability are still unsolved; likewise the problem of selective heating effects.

On the basis of these considerations it is imperative to sound a warning against the prevailing compaign to sell short wave apparatus to inexperienced physicians under the claim that it is simpler, safer and more effective than the "old-fashioned" diathermy machine. No physician who is not well grounded in the application of regular diathermy should embark on the use of short wave diathermy apparatus. Notwithstanding the enthusiastic propaganda to the contrary, short wave diathermy is still in the experimental stage and its potential dangers are still problems even for the expert.

RICHARD KOVACS, M.D., New York.

DIAGNOSIS OF CINCHOPHEN POISONING

To the Editor:—In the clinical note by Dr. Samuel Peluse entitled "Cinchophen Poisoning, with Autopsy: Report of a Case Due to Cinsa-Vess," which appeared in THE JOURNAL September 28, the author describes in detail the clinical picture presented by a patient suffering from a severe hepatic degeneration. After four weeks of hospitalization and extensive study (as a result of which no precise diagnosis was reached) she was seen by Dr. Andrew Sullivan, who, we are told, "immediately recognized the patient's clinical picture as one due to cinchophen poisoning." Subsequent questioning of the patient revealed the fact that she had taken a proprietary preparation of cinchophen over a period of three months prior to the first signs of jaundice. The question paramount in my mind is this: By what means did Dr. Sullivan "immediately recognize the patient's clinical picture as one due to cinchophen poisoning"? So far as I have been able to determine, there is nothing peculiar to the symptomatology resulting from acute yellow atrophy of the liver that might point to etiology. I have always believed that the specific causal factor could be learned only from the history. If, however, in the absence of a history of cinchophen ingestion, Dr. Sullivan can recognize cinchophen poisoning, I am sure we should hear more from him. One other point in Dr. Peluse's article raises a question. He states that "Dr. Sullivan had recently survived a toxic jaundice due to cinchonism." Is it not exceedingly rare for quinine to cause jaundice?

CHARLES S. CAMERON, M.D., Philadelphia.

[This letter was referred to Dr. Samuel Peluse, who writes:]

To the Editor:—I wish to thank the writer for calling attention to the erroneous use of the term "cinchonism." The following is Dr. Sullivan's response:

"In this instance, although the diagnosis was clearly made without a history and by simple inspection of the patient, there is only one thing that was outstanding in the picture which caused me to differentiate instantly from the jaundice due to an acute catarrhal condition, to obstruction of lithiasis or to obstruction from neoplasm, and that was the uniformly intense deposit of bile pigment throughout the skin. In three other cases which I had seen, the pigmentation was to me characteristic in the uniformity and intensity, although in one case the color varied, the skin of the patient having a greenish hue. In this case, capsules of an unknown substance had been taken over a relatively long period of time. In other words, the whole question simmers down to the fact that I had a relatively large number of cases due to cinchophen poisoning, and the appearance of jaundice of this degree naturally arouses suspicion of cinchophen derivatives having been used. I believe that any one who has seen a number of these cases would receive a similar impression which would cause him immediately to suspect cinchophen compounds in this type of pigmentation and differentiate the majority of cases of jaundice due to other causes."

SAMUEL PELUSE, M.D., Chicago.

SPONTANEOUS LATE DESCENT OF THE TESTIS

To the Editor:—In THE JOURNAL, March 10, 1934, you published my observations on this subject. Although I suspect that general practitioners do not as a rule refer youngsters with undescended testes to surgeons for operation, several articles by surgeons have recently appeared urging operative intervention, and this prompts me to send you this communication. Not content with the Torek operation, which is a two stage procedure, one well known surgeon is now advocating in cases in which there is difficulty in drawing the testis down into the scrotum a preliminary procedure, the testis being brought first to the external inguinal ring and left there until the Torek operation is performed at a later date—a three stage operation.

Operation for this condition being no minor procedure, it would be all the more unfortunate if it should be undertaken unnecessarily. The increased incidence of malignancy in undescended testis which has been reported is such a remote possibility that surgeons as a rule do not give this as indication for operation. The operation is advocated usually in order to prevent atrophy of a testis after puberty. If most undescended testes descend spontaneously by the fourteenth year, this indication for operation is lacking. In my article mentioned, I

reported the experience of others and my own to show that spontaneous late descent does occur in nearly all the cases by the fourteenth year—some even later.

To recite briefly the final outcome in my small series of eleven boys (one bilateral case), just one testis has not spontaneously descended to date. Since I wrote the article one of the two reported as still undescended has appeared outside the external inguinal ring, admittedly not at a satisfactory location but where it often remains following operation. One other which descended in the sixteenth year is now midscrotal in position and slightly atrophied. One boy developed a hernia on the side of the late descent, which required operation and later examination failed to disclose the whereabouts of the testis although it was not intentionally removed by the surgeon. In the remaining eight cases the testes are in the normal position low in the scrotum and normal in size.

Surgeons are, I believe, reporting better final results since the adoption of the Torek operation. Before this comparatively new operation the final results, to judge from the literature, were not at all satisfactory.

I am sending you this communication in order to call attention once more to a fact not universally recognized, that rarely is operative intervention for undescended testes indicated, and to save these little chaps from needless discomfort, expense and the certain amount of risk incident to any operation. For my own part I will continue to advise what one surgeon has referred to as my policy of "neglect" rather than to recommend what seems obviously to be "meddlesome surgery."

CARL B. DRAKE, M.D., St. Paul.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted on request.

DIABETES IN DOCTORS

To the Editor:—In a survey on causes of deaths among physicians as reported in THE JOURNAL during 1934, my attention was attracted to the rather high incidence of diabetes, fifty-one in all, according to the following grouping: fifth decade, three; sixth decade, seven; seventh decade, twenty; eighth decade, seventeen; ninth decade, three; tenth decade, one. I have asked myself: Is it due to negligence or to lack of insulin used or has insulin not proved effective in the higher age groups? What is your explanation?

HANS SCHROEDER, M.D., New Orleans.

ANSWER.—Diabetes is not excessive among doctors. Two hundred and twenty physicians died in Massachusetts during 1931 and 1932, according to figures compiled by the Massachusetts Department of Public Health. Diabetes was eighth in importance. For 1933 in the United States the percentage of the deaths of physicians dying of diabetes was 2.1 per cent, and diabetes ranked seventh.

In a certain clinic the average duration of life in ninety-six fatal cases of diabetes in physicians was 10.8 years, and in 1934 145 living physicians (excluding one patient who cannot be traced) under observation at this clinic had already reached ten years. The average age at death of these ninety-six doctors was 63.9 years, and the average age of the living doctors is 55.6 years. As a great proportion of the fatal cases occurred prior to the discovery of insulin, it is evident that the duration of life of the 145 living physicians with diabetes will probably reach fifteen or more years.

The onset of diabetes in the medical profession as based on the data from this clinic runs true to form, because the greatest number developed the disease in the sixth decade. In no instance was the onset in the first decade; there was one case in the second; twenty-four occurred in the third, making it probable that a considerable number of students having diabetes entered medical schools, thirty-six in the fourth, fifty-six in the fifth, seventy-four in the sixth, forty in the seventh, nine in the eighth, none in the ninth, and in two cases the onset date was unknown.

A diabetic heredity in diabetic doctors reaches approximately 33 per cent and presumably is considerably above this figure, because in fourteen of the 242 cases the data on heredity were unknown or unsatisfactory, and many of the other doctors have not been seen recently. The total heredity was demonstrable in seventy-three cases. In forty-seven it was of a hereditary character and in forty of a familial character, but in fourteen cases it was both hereditary and familial and thus a reduction was made for this double heredity.

Among ninety-six diabetic doctors, tuberculosis and infections each caused 5.2 per cent, cancer 6.2 per cent, coma 15.6 per cent, cardiorenal and vascular disease, including gangrene and apoplexy, 55.2 per cent, and miscellaneous conditions 12.5 per cent of the deaths.

Since the average age of doctors who succumb, 63.9 years, is practically the average age of death of all doctors, it can be inferred that diabetes in doctors is fairly well treated. The fact that 145 living diabetic doctors have already had the disease nearly as long as the doctors who have died of it is evidence of the marked improvement in treatment.

THYROID IN ASTHENIA

To the Editor:—For the last four months I have been treating a woman, aged 29, married, a nullipara, who has been complaining of lassitude, tiredness and obesity. A year ago she was under the care of another physician, complaining of irregular menstrual periods, a weight of 174 pounds (79 Kg.) and the foregoing symptoms. She was placed on 2 grains (0.13 Gm.) of thyroid daily, glycerin extract of whole ovary, one pill twice a day, and diet, which treatment resulted in a loss of 22 pounds (10 Kg.) and partial abatement of symptoms; the menstrual periods became regular but scant, lasting two-three days. My first physical examination of the patient revealed a weight of 165½ pounds (75 Kg.), height 5 feet 4 inches (163 cm.), pulse 69, blood pressure 130 systolic, 70 diastolic, basal metabolism —17, temperature 98.4 F., a blood count of 4,600,000 red blood cells, hemoglobin 90 per cent, 5,400 white blood cells, polymorphonuclear cells 65 per cent and lymphocytes 36 per cent. Urinalysis was negative. There was a mild edema of the extremities, nonpitting in character, suggestive of myxedema. My diagnosis was pituitary thyro-ovarian dysfunction. She was put on a 1,500 calory diet, given 1 grain (0.065 Gm.) of thyroid extract, 2 grains (0.13 Gm.) of anterior pituitary substance, and 5 grains (0.3 Gm.) of whole ovarian gland three times a day after meals. For the next two months, improvement followed; the weight went to 155½ pounds (70.5 Kg.), the periods became normal and some diminution of the lethargic feeling resulted. In April her basal metabolism was —5.3 per cent and the lethargic feeling became more pronounced. She had also developed an eruption over her shoulders and neck; it extended into her scalp a short distance. This eruption is reddish brown, papular, flattened, slightly raised, does not produce itching unless aggravated by perspiration, and tends to coalesce. The thyroid substance was discontinued for a month but the rash persisted. There is no history of other drugs taken or of food allergy. At the present time the patient is receiving 3 grains (0.2 Gm.) of thyroid extract alone, daily. Her weight now is 155½ pounds (70.5 Kg.), pulse 85, blood pressure 138/84. Please advise me as to the correctness of the treatment. Can thyroid extract produce such a rash (a review of all literature fails to disclose any evidence of thyroid substance producing such a lesion). Kindly give any suggestions that you can in the diagnosis and treatment of the case. Please omit name.

M.D., New York.

ANSWER.—The use of desiccated thyroid is correct, although if the patient's metabolic rate can be maintained at a normal level with less than 0.2 Gm. of thyroid daily it is preferable to use the smaller amount. The use of pituitary and ovarian preparations does not offer much hope in this type of case. It is extremely unlikely that the thyroid has anything to do with the rash. The patient should adhere to a diet low in calories and yet relatively high in protein and vitamins. During the war it was discovered that women who did not receive an adequate amount of protein developed menstrual irregularities. In addition to the vitamins in the diet, it might be well to give the patient brewers' yeast and cod liver oil. Needless to state, the patient should be advised to have plenty of outdoor exercise and to maintain regular hours and habits of living.

USE OF ANESTHETICS BY GWATHMEY METHOD

To the Editor:—I wish to place some anesthetic (topical) in the Gwathmey rectal ether oil solution (4 ounce mixture, 2½ ounces of ether) which will make it less irritating. I notice that Babcock's Surgery mentions chlorbutanol, Gm. 0.6, in an ounce mixture. It is my understanding that chlorbutanol and butyn are the same. Will you state an amount of butyn (2 per cent) that may be safely used in a 4 ounce mixture of oil ether for obstetrics. Please also advise whether the use of olive oil has any advantage over liquid petrolatum as the vehicle.

M.D., Alabama.

ANSWER.—Insert a well lubricated 22 F. catheter from 6 to 8 inches into the rectum, passing the presenting part. Instil the rectal mixture within thirty seconds (within a pain interval) instead of fifteen minutes with either a McCormick apparatus or aseptosyringe, with instructions to the patient to "squeeze up" in order to retain the mixture completely. With this technic there will be no irritation, as a rule.

Chlorbutanol and butyn are entirely different in structure and composition. Chlorbutanol, 1 Gm., is used as a routine procedure in surgical cases as a suppository preceding the oil-ether mixture or combined with the mixture for the double purpose of allaying irritation and deepening the anesthesia. Chlorbutanol, 0.65 Gm., could be substituted for paraldehyde, 7.5 cc., in the mixture. Olive oil is commonly used as the vehicle but has no special advantage over liquid petrolatum.

PERSISTENT VAGINAL DISCHARGE

To the Editor:—About six weeks ago a married woman of 32 consulted me because of a moderate vaginal discharge for seven months. The woman has one healthy child. There were no miscarriages or abortions and menstruation was normal. There were no urinary symptoms. Physical examination was essentially negative. Examination of the pelvic organs showed slight tenderness and thickening of the right parametrium. There was a moderately profuse purulent discharge from the cervix, which, however, appeared to be normal otherwise. The vaginal mucosa was slightly reddened. Repeated smears for gonococci were negative and examination of a hanging drop for Trichomonas vaginalis was negative. The blood Wassermann and gonococcus complement fixation tests were negative. The woman received conservative treatment during the past seven months, consisting of tampons and douches variously medicated. I contin ed these procedures, supplementing them with the use of silver trinitrophenolate suppositories and the weekly intradermal injection of a solution of lactalbumin. In three or four weeks the discharge cleared up entirely (which it had never done before) and the injections and tampons were discontinued. In two weeks, however, the discharge recurred and at present is as annoying as it was at the beginning. I am writing to ask for information regarding further conservative measures. It is probable that this is a favorable case for the use of local heat in the pelvis. However, I do not have the suitable apparatus but, of course, if this is the only remaining measure, will arrange for the patient to obtain the benefits of such treatment. She is interested in knowing whether operative removal of the right tube and ovary in such a case is desirable. I did not feel that the circumstances warranted such a procedure. What do you think about this?

M.D., New York.

ANSWER.—The policy of conservatism should be followed in this case. There is no assurance at all that removal of the right tube and ovary will result in the disappearance of the discharge, especially because tubo-ovarian inflammation is a rare cause of vaginal discharge. However, carcinoma of the tube is frequently accompanied by a discharge from the vagina. In spite of the fact that the description of the discharge is not typical of a monilia infection, it is advisable to look for this organism both in hanging drops and in stained smears. If the organism is found, rapid and decided improvement can be obtained by applying a 1 per cent solution of gentian violet all over the vaginal mucosa, the cervix and the vulva. This treatment should be given daily three or four times and another course of treatments repeated after an interval of a week. More hanging drops should be studied for Trichomonas vaginalis, especially immediately after a menstrual period. Likewise smears for the gonococcus should be made after the menstrual flow and after silver nitrate has been applied to the cervical canal. Occasionally the offending organism shows up at these times and at no other. Skene's and Bartholin's glands should be carefully examined for gonococci, and it may be advisable to investigate the rectum also for the presence of these bacteria. Naturally, if any pathogenic organisms are found, treatment should be instituted. The use of heat applied locally to the pelvis should be of help to the patient. Perhaps a discussion of the patient's sex life may shed some light on the etiology of the discharge.

FAILURE OF PERIPHERAL CIRCULATION

To the Editor:—In your reply to a question in Queries and Minor Notes (THE JOURNAL, June 15, p. 2204), concerning digitalis, you speak several times of failure of the "peripheral circulation" as if myocardial and peripheral circulatory failure were separate and distinct things requiring different treatment. Will you be good enough to tell me just what you mean by failure of the peripheral circulation?

COLLINS H. JOHNSTON, M.D., Grand Rapids, Mich.

ANSWER.—In the proper function of the circulation, the normal activity of the heart and that of the peripheral minute vessels constitute the two most important factors. In a healthy person a relationship exists between the function of the heart and the function of the peripheral vessels which results in an economic function of the heart as well as in an economic local supply of blood to the tissues in case of active demand. In instances of disease of the heart, changes in the function of the peripheral minute vessels, particularly of the arterioles and of the venules, often compensate for the inadequate function of the heart. This, of course, also implies that frequently disease and failure of the heart may exist in the presence of normally functioning peripheral blood vessels. Contrariwise, there are instances in which the function of the peripheral vessels becomes disturbed, in spite of the fact that the heart is not diseased. Such disturbance or disease of the peripheral blood vessels may result in death. When such a situation exists, one may speak of failure of the peripheral circulation. This term is often used synonymously with shock and peripheral collapse.

The detailed mechanism of failure of the peripheral circulation is not known as yet. The main feature of the condition is stagnation of blood in the periphery, usually in the small venous reservoirs of the vascular system. As a result of such stagnation there is a progressive lack of return of venous blood to the right side of the heart. This in turn results in a progressive decrease in the cardiac output and a generalized ischemic state of the arterial circulation. It is claimed by some that the arterioles are in active spasm and the venules in a state of paresis. The heart itself is capable of taking care of whatever blood arrives. The causes of failure of the peripheral circulation may be multiple; the most important etiologic factors, however, are depression of the vasomotor system and paresis of the minute vessels induced by circulating chemical substances. Often failure of the peripheral circulation does not exist in pure form but is associated with failure of the heart also.

As a postoperative circulatory complication, acute or subacute congestive failure of the heart is comparatively rare, while failure of the peripheral circulation (collapse or shock) is relatively common. The principles of treatment of failure of the peripheral circulation in many respects differ essentially from the principles of treatment of heart disease.

SENSITIZATION DERMATITIS

To the Editor:—A white man, aged 60, whose past history is negative except for smallpox in childhood, has had thickening of the epidermis, and cracking and ulceration around the nails for the past twelve years. There is similar but less extensive involvement on other parts of the fingers and also severe itching of the hands and forearms. There are occasional discrete hard white masses about the size of millet seeds, which develop in the skin of the fingers and which the patient scratches off from time to time. There is no history of other allergic symptoms or of exposure to any substance that might be responsible. The lesions do not develop crusts, are never purulent and are most severe on the dorsum of the finger, completely surrounding the nail, the distal phalnax being somewhat swollen. In places the skin is thick and hard with occasional itching, and finally deep fissures are formed and desquamation occurs. On the forearms, especially on the flexor surface, the patient has innumerable scratches. He states that a small erythematous patch forms, which itches severely. The patient has no other symptoms and physical examination is negative, the blood and urinary examinations giving normal results. I doubt that this is infectious in origin and it does not conform to my impression of eczema.

M.D., Illinois.

ANSWER.—The occupation is not given, but every one has plenty of daily contacts to account for a sensitization dermatitis, which the description of this one suggests. The paronychia is a manifestation of the chronic effects; the small erythematous patches, of the acute ones. The unrestrained scratching of the forearms suggests a nervous element.

The infiltration of chronic inflammation, with possibly some hyperkeratosis, decreases the elasticity of the skin and gives rise to fissuring. The ulceration is probably the result of fingernail removal of the small white bodies. If these are found only on the dorsum of the fingers, they may be milia, subepithelial pellets of hardened sebaceous secretion, which sometimes occur in areas of chronic inflammation. Eczema is a broad enough term to cover a case of this nature.

Further effort should be made to discover the irritant or irritants responsible, but in chronic cases the sensitization is commonly too complicated to be easily unraveled. Alkalis and other irritants should be avoided. For the acute erythematous patches, soothing in place of scratching is recommended, calamine lotion made with equal parts of lime water and rose water, or a tragacanth lotion containing 2 Gm. of tragacanth powder to 120 cc. of water. In these may be incorporated phenol and glycerin, 0.5 per cent of each, or menthol 0.25 per cent.

On the areas of chronic inflammation a zinc oxide paste containing salicylic acid may be applied thickly at night, and cotton gloves or bandages used to retain it. This should be tried first on one finger during waking hours to make sure that it does not irritate. In the morning, the paste should be removed with oil or liquid petrolatum and an ointment of sulfur and oil of cade, 5 per cent of each, should be applied. This also should have a preliminary trial. It may be that ordinary crude coal tar ointment, 6 per cent each of crude coal tar and zinc oxide in petrolatum, will be better borne. If irritation results, soothing remedies may be applied. When it subsides, treatment should be resumed.

The nervous element must not be overlooked.

CHEMICAL CAUSES OF NEURITIS

To the Editor:—Following is a report of an analysis of a potash used for fertilizing purposes:

	Per Cent
Moisture	0.2
Potassium chloride	31.8
Sodium chloride	46.2
Magnesium chloride	0.9
Calcium sulphate	17.2
Aluminum silicate	3.5
Iron sulphate	Trace
(Negative tests for thallium, lead, arsenic.)	
	99.8

I recently examined a man suffering from a typical case of multiple neuritis and am writing to ask you whether there is anything in this preparation that could possibly constitute the etiologic factor. The man had been unloading potash from the hold of a ship. Several reports have recently been made of longshoremen who have been engaged in unloading this substance complaining of general ill health, with no particular symptoms; but no other cases of multiple neuritis, so far as I know, have occurred.

E. W. APPLEBE, M.D., Houston, Texas.

ANSWER.—Nothing in the mixture of chemicals cited is likely to lead to a neuritis. Although arsenic is specified as being absent after testing, crude fertilizer chemicals are likely to contain arsenic as an impurity. Arsenic could well account for a multiple neuritis. Of the three major constituents shown, potassium chloride attracts the most attention as a possible toxic agent. Any suspicion is dispelled through the fact that this substance is frequently used in medicine in doses as high as 2.6 Gm. (40 grains). Cushney has been quoted by Addison with respect to potassium salts that "no danger arises to man unless given intravenously." The action of potassium chloride on the peripheral nerves is that of a depressant and therefore conceivably this substance might be utilized in the treatment of a multiple neuritis. When very large doses of potassium chloride are administered (from 5 to 10 Gm.) no symptoms may arise except in nephritic states. When poisoning occurs under these circumstances, the chief manifestations are cyanosis, weak pulse and vomiting.

Although this combination of chemicals is regarded as an unpromising source of the causative agent of a multiple neuritis, additional inquiry should be instituted as to other chemicals that may have previously constituted the cargo of the ship. On occasion, relatively small quantities of previous chemical cargoes may react with chemicals making up subsequent cargoes, leading to harmful gases, dusts and vapors. Unless some accidental combination of this character has taken place, it is unlikely that much consideration should be extended to the chemicals mentioned (in the absence of impurities) as the ultimate cause of a multiple neuritis.

PERSISTENT HEMORRHAGE AND INFECTION IN EAR

To the Editor:—A woman who had a bleeding ear had a mastoid operation after consultation. The wound refused to heal on account of a greenish stain from Bacillus pyocyaneus. Reoperation has led to the cessation of bleeding but plenty of greenish exudate and stain. Dilute solution of sodium hypochlorite and the quartz light are now being used. The radical mastoid operation has not been done. Kindly advise me what you think of the case, with treatment.

M.D., Delaware.

ANSWER.—In the absence of any statement as to the length of the discharge from the affected ear or as to the pathologic condition in the middle ear responsible for the bleeding, it is difficult to give a definite opinion. Ordinarily, bleeding from the ear, with the exception of those instances due to a new growth, is due to granulations in the middle ear, the result of a long standing bone disease. Conditions of this character do not yield to a simple mastoid operation. Probably the thing to be considered at present in the way of operative intervention from the symptoms as given is a radical mastoid operation.

ZINC CHLORIDE BURNS

To the Editor:—In an automobile radiator manufacturing plant where I do the first aid work, a "zinc chloride flux" with the following formula seems to be the cause of many deep necrotic so-called acid burns. I should apperciate any information you can give me as to the reagent actually causing the burns, treatment, and suggestions for prevention.

Zinc chloride content	from 47.4 to 48%
Ammonium chloride	3.0 plus or minus 0.50%
Free acid as HCl	0.15%
Iron and aluminum total maximum	0.05%
Heavy metals, such as lead, cadmium and antimony, total maximum	0.05%

Please omit name.

M.D., New York.

ANSWER.—The reagent causing the burns is zinc chloride, which is a powerful caustic. Treatment consists in removing the necrotic slough and filling the wound with sodium bicarbonate. Gloves should be worn when handling the "flux."

ICTUS WITH APHASIA

To the Editor:—A healthy man of 76 walks 2 miles to work every day because he likes it. About 11 a. m. while urinating, but with no particular effort, he started to say something but discovered that he could only mumble unintelligibly. Being a telegraph operator, he tried communication by telegraph with another operator in the office, and it worked perfectly. He could not use a typewriter quite as usual, as he kept striking too close. The blood pressure is 110 systolic, 70 diastolic. Examination of the urine gives negative results. The heart is normal. In about an hour and a half improvement began, and in another half hour recovery was complete. Hysteria and neurosis are utterly out of the question. It was very galling to his pride. There were no previous symptoms, pain or muscle impairment, except that he felt as though his mouth were drawn to one side at first. It was symmetrical when I arrived. What is the probable explanation?

M.D., Michigan.

ANSWER.—The history given sounds as if the patient had a small ictus. It is possible that this was due to a thrombosis of a small blood vessel, which produced the symptom of aphasia because of the associated edema. When this edema cleared up his ability to talk returned, as evidently the thrombosis did produce a softening in the speech center. It is likely that the patient will have further attacks of a similar nature.

TREATMENT OF LOCOMOTOR ATAXIA

To the Editor:—I would appreciate some information as to the best treatment of a case of beginning tabes in a woman, aged 44. She has had syphilis for a number of years. The blood Wassermann reaction has been negative for the last two years. A recent spinal fluid reaction was slightly positive with 0.2 and 1 cc. The colloidal gold test is 0122100000; Ross Jones and Noguchi, faintly positive. The patient is beginning to show the early symptoms of tabes, as a velvety feeling of the feet and stumbling in the dark. Please omit name.

M.D., Wisconsin.

ANSWER.—The special method of treatment in this case is probably that which Stokes terms the mild routine treatment. Neoarsphenamine in doses of 0.45 Gm. should be given intravenously twice a week for six weeks, accompanied by the administration of a heavy metal. For this purpose a 50 per cent mercurial inunction should be rubbed into the extremities four times a week during the six weeks course of neoarsphenamine. In administration, care should be taken to avoid mercurialism. A rest period of two or three months should be given before another course, followed by careful reexamination of the patient.

EMPTYING SEMINAL VESICLES

To the Editor:—A man, aged 31, with a history of urethritis five years ago and a relapse three years later, complains of deficient erection and premature ejaculation. This condition antedated the infection. Examination shows a morning drop containing many pus cells. Prostatic massage shows the prostate about normal in size, and 2 cc. of secretion obtained shows about 20 pus cells to a high power field and many sperms. The seminal vesicles can be outlined as being quite distended but are beyond the point at which adequate finger pressure can be applied in order to evacuate their contents. For the past month the patient has been treated with massage, urethral irrigation of potassium permanganate, posterior urethral instillation of 1 per cent silver nitrate, and foreign protein intramuscular injection twice a week. Sounds are passed preliminary to the instillations. Is there any means at hand of securing emptying of the seminal vesicles, and is there any efficient instrument available on the market for this purpose in such cases? At present he practices rather unsatisfactory intercourse about once a week. Would a normal orgasm produce appreciable emptying of the seminal vesicles as described?

M.D., New Jersey.

ANSWER.—There is an instrument on the market which can be fastened to the index finger for the purpose of carrying out high rectal massage. This should be used with caution, as it is difficult at times to judge the amount of pressure produced. A normal orgasm will empty the seminal vesicles fairly well, provided the ejaculatory ducts are patent. These are frequently narrowed as the result of inflammation, or blocked by the products of inflammation, preventing thorough emptying of the vesicles.

NAUSEA AT MENSTRUAL PERIOD

To the Editor:—A single woman, aged 35, has attacks of nausea every time she menstruates. This phenomenon has occurred with regularity for the last six times that she has menstruated. When she finishes menstruating the nausea subsides immediately. I thought that this may be associated with some endocrine dysfunction but I am unable to figure it out. Would you suggest using endocrine preparations?

M.D., Pennsylvania.

ANSWER.—Since this patient has arrived at the age at which marriage and childbearing seem remote to her, there may be a strong psychic factor in the occurrence of the nausea during the menstrual periods. However, it is advisable to try to rule out any organic disturbance in the gastro-intestinal tract, par-

ticularly in the gallbladder. Endocrine therapy will most likely be helpful only if it has an effect on the psyche. If no organic disturbance can be detected, a frank discussion of the patient's outlook on her future may prove of value.

TOXICITY OF METHYL ETHYL KETONE—BUTANONE

To the Editor:—Will you kindly supply me with information concerning methyl ethyl ketone, also known as butanone. This substance is mixed with benzene in the proportion of 40 per cent butanone and 60 per cent benzene and used as a solvent in a certain process of petroleum refining. Owing to the nature of this process, employees might be subjected to skin exposure to the liquid form as well as to the vapor form. Also the fumes or vapors might be inhaled by employees from time to time. I understand that the product is manufactured by the Shell Chemical Company, but I do not know its address. I also understand that this company is the first to use methyl ethyl ketone on a commercial basis, although this product has been a laboratory chemical for some time. So far I have had a little clinical experience with the effects of the benzene methyl ethyl ketone mixture. The effects which I have observed are as follows: 1. Effects on the skin: A reddening, and the patients have complained of a stinging and burning sensation over the affected areas; it is my opinion that these areas would have blistered soon if treatment had not been given. 2. Effects on the respiratory system: Hoarseness, complaint of a burning, stinging sensation in the nose, throat and lungs, increased rate and depth of respiration, slight reddening of the mucosa of the nose and throat. 3. General effects: Headache, vertigo, nausea, vomiting, a feeling as if the patient were floating away, increased pulse rate, and a feeling of weakness in the legs. All these effects have apparently been transitory, with no permanent ill effects. I have noted no symptoms or signs after forty-eight hours following the exposure. All cases that I have seen have been acute, and I have not seen any chronic effects. The information that I desire consists of the possible and probable effects of the liquid as well as the gaseous form. The treatment that I have used has been bismuth paste for the skin lesions, aromatic spirit of ammonia by mouth and by inhalation, and mild protein silver into the eyes and nostrils. Soap and water are applied to the skin prior to the paste. Does this treatment seem adequate? If not, what treatment do you recommend? What procedure do you suggest for checking up on the possible ill effects on workmen handling the benzene methyl ethyl ketone combination? In other words, please give me all the available information concerning the diagnosis, treatment, prevention and possible ill effects of the liquid and gaseous forms of the benzene methyl ethyl ketone combination described.

M.D., Texas.

ANSWER.—It is presumed that, in this mixture of 60 per cent benzene and 40 per cent methyl ethyl ketone, no new chemical is produced and that the two substances mentioned remain as entities. Of these two, benzene (benzol) is far more toxic. Methyl ethyl ketone is not known to possess toxic properties beyond the capacity to defat the skin and thus pave the way for minor dermatitis. The ketones are ordinarily rated as having about the same toxicity as acetone. This matter is discussed by Loevenhart, Kerr and Walton in "A Comparison of the Pharmacological Action of Diacetone Alcohol and Acetone" (*J. Pharmacol. & Exper. Therap.* **33**:175, 1928). On the other hand, benzene is a highly dangerous substance to which workers should not be subjected under conditions that lead to the inhalation of vapors in concentrations above 300 to 500 parts per million parts of air. Benzene may be absorbed through the skin, although this portal of entry is not well established as a source of systemic benzene poisoning. Like methyl ethyl ketone, benzene serves as a defating agent for the skin and readily leads to a dermatitis. The effects described as "general" and "on the respiratory system" are fairly characteristic of acute benzene poisoning. It is predicted that any consistent exposure will eventuate in direful chronic manifestations. Examinations of the blood should be made for leukopenia, diminutions in the total red count, hemoglobin, and increase in the clotting time of the blood. Extensive information on benzene poisoning will be found in the publication by McCord and others entitled "Benzol (Benzene) Poisoning," 1932. The treatment mentioned may be adequate on a symptomatic basis, but much more extensive preventive measures should be undertaken. Direct contact with the skin should be obviated. The inhalation of more than 500 parts of the mixture by workers should not be tolerated. The wearing of respirators as a means of protection against benzene is ordinarily not efficacious. The wearing of positive pressure helmets may provide adequate protection, but such practice is onerous for workmen and impossible unless the work is fairly closely limited to fixed areas, such as ordinarily does not prevail around petroleum refineries. Completely enclosed systems or venting systems have proved to be safest in providing acceptable work conditions in connection with the utilization of benzene under conditions otherwise favorable to high concentrations of vapors that might be respired by workers.

Alice Hamilton in her textbook (Industrial Toxicology, New York, Harper & Bros., 1934, p. 156) says in regard to benzene: "It is so recognized [as the most dangerous poison in industry with the exception of tetrachlorethane], and its use has been abandoned, often at a good deal of sacrifice, by conscientious employers who refuse to subject their workers to such a risk. But apparently as soon as it is given up in one industry it is adopted in another, and eternal vigilance is needed if chronic benzol poisoning is to be prevented."

DIAGNOSIS OF PERNICIOUS ANEMIA

To the Editor:—A white woman, aged 60, widowed, had been feeling weak for six weeks, with palpitation of the heart and fainting spells. She stated that she had been conscious of lack of blood for the past twenty years. She had an operation for goiter at the Mayo Clinic in 1915. She had associated symptoms of palpitation, syncope, a tingling sensation in the feet and hands, sore tongue and diarrhea, with an absence of hydrochloric acid in the Ewald test and splenomegaly. Pernicious anemia was diagnosed and she was placed on dilute hydrochloric acid and raw liver, on which diet she gained 38 pounds (17 Kg.). Jan. 29, 1934, 3 cc. of concentrated solution liver extract every other day was prescribed. At that time the blood count was 1,980,000, with 46 per cent hemoglobin. Reticulocyte response was immediate, so that on January 31 it was 6.4 per cent, February 2, 12 per cent; February 5, 11.6 per cent; February 7, 7.2 per cent; February 9, 5 per cent. The first rise occurred on February 2, with the second rise February 19. The erythrocytes increased from 1,980,000 with 46 per cent hemoglobin at the beginning of treatment to a maximum of 6,300,000 with 110 per cent hemoglobin (photelometer) and 2 per cent reticulocytes on May 5. The liver medication was discontinued on March 2, at which time the erythrocyte count was 5,030,000, with 100 per cent hemoglobin. The reticulocytes numbered 2 per cent. The leukocyte count ranged from 6,800 with 46 per cent polymorphonuclears, 52 per cent lymphocytes and 1 per cent eosinophils prior to the administration of liver to between 6,000 and 8,000 with 74 per cent polymorphonuclears, 26 per cent lymphocytes, except for a period between February 19 and March 2, when an acute infection of the upper respiratory tract brought the leukocyte count up to 12,000 or over, with 82 per cent polymorphonuclears, 12 per cent lymphocytes and 6 per cent eosinophils. Additional laboratory reports April 25, 1934, revealed a negative Wassermann reaction; nonprotein nitrogen, 46; urea, 15; uric acid, 6.4; creatinine, 1.5; sugar, 125. When the fragility of the blood was tested, hemolysis began at 0.48 per cent and was completed at 0.32 per cent. Marked hemolysis occurred up to 0.44 per cent. Control 1-2: Hemolysis began at 0.46 per cent, and was not completed at 0.28 per cent; marked hemolysis occurred up to 0.36 per cent. The gastric contents showed a heavy trace of bile, complete absence of hydrochloric acid, total acid 7 and no occult blood. The patient was next observed Jan. 15, 1935, because of a cellulitis of the left leg due to injury. The temperature was 100 and the respiration rate 24. Leukocytes numbered 17,000, with 88 per cent polymorphonuclears. Hemoglobin was 110 per cent. There were 4,700,000 erythrocytes. The patient was next seen April 24, when the erythrocytes numbered 6,200,000, with 135 per cent hemoglobin (Sahli). The leukocytes numbered 12,400, with 85 per cent polymorphonuclears. The erythrocytes increased to 6,330,000 with 142 per cent hemoglobin (Sahli), at which time the patient died, apparently from cardiac failure, general debility and polycythemia. This is rather an unusual picture, to have gone from oligocythemia to polycythemia, particularly after the liver had been discontinued for a period of three months. I felt sure that the case had all the earmarks of a pernicious anemia, owing to the reticulocyte response to liver, the absence of hydrochloric acid, the absence of a vibratory sense in the bones and other neurologic changes. Have there been any such cases reported in medical literature?

M.D., Oklahoma.

ANSWER.—There appears to be no reference in the literature to a case with exactly the characteristics of this one. Naegeli (Blutkrankheiten und Blutdiagnostik, 1931, p. 577) mentions a "reparative polyglobuly" during the period of compensation after anemias. The exact nature of the anemia in this patient is not clear from the data given. There may have been myxedema following the "operation for goiter." An anemia of this type, with response to liver therapy, may occur during the course of cirrhosis of the liver. The splenomegaly, rare in true pernicious anemia, is compatible with this. The response to liver therapy is quite unusual, quantitatively, especially the continuation of the rise in the number of red blood cells for such a long period after the cessation of the treatment. It is suggestive of the polycythemia that accompanies, at times, cardiac decompensation. Absence of vibratory sense and nonsecretion of hydrochloric acid may be characteristic of other conditions besides pernicious anemia.

CRACKING NOISE IN JAWS

To the Editor:—A woman, aged 19, after a tonsillectomy some years ago developed a cracking noise on opening her mouth. I believe that this condition is termed "clacking jaw." At present she has great discomfort on eating or having dental work done. What is the most advisable treatment for this condition?

SAMUEL J. HILLER, M.D., Milwaukee.

ANSWER.—The condition is brought about by an irritation of the synovial membrane of the temporomaxillary articulation (glenoid fossa). It is caused either by trauma, such as opening

the jaw too wide or holding it open too wide for too long a period, or by paralysis of the nerve innervation to the membrane.

The treatment in these cases is complete rest and massage. It may be necessary to ligate the teeth into occlusion for two or three weeks in order to reduce the inflammation of the membrane. It is then necessary to watch that the patient does not open the mouth too wide in eating, yawning or having dental work done, until the condition is cured. The massage should be light and over the area of the head of the condyle, should begin at once and should continue until the cure is complete.

BLOOD TESTS FOR PATERNITY

To the Editor:—Will you please tell me how old an infant should be before agglutination tests can be used to determine his paternity? I understand, of course, that these tests only eliminate certain men as parents. But I want to know how old the infant should be before they can be depended on.

M.D., New York.

ANSWER.—In cases of disputed paternity, reliable results can be obtained even when the blood of new-born infants is tested. Although it is true that as a rule the blood group is not completely developed at birth, this in no way interferes with the determination of the blood group. The reason for this is that the defect involves only the iso-agglutinins in the child's serum, since the agglutinogens are present in the red blood cells at birth. For the determination of the blood group, the usual procedure is to test the unknown blood cell suspension with known serums of group A and group B. The converse test, of the patient's serum against known blood cells of groups A and B, serves as a useful check on the grouping, which, incidentally, should never be omitted in forensic cases but which is not absolutely essential. This check is naturally not available when infant's blood is tested; but if testing serums of high potency are used, the group can be reliably determined by testing the red cells alone. If any doubt remains, the blood should be retested at a later date, after the agglutinins have developed.

CANNABIS INDICA—ALCOHOL—KETOGENIC DIET IN EPILEPSY

To the Editor:—I will appreciate information on the chemistry and physiologic action of Cannabis indica; in fact, anything written authoritatively on this subject. What is the physiologic action of alcohol on the sympathetic nervous system, including the adrenals? What is the latest treatment of epilepsy, based on scientific principles and not on wishful thinking? What is the scientific explanation for the use of the ketogenic diet in epilepsy? Can you give me any good authors on these subjects?

E. J. ASNIS, M.D., Philadelphia.

ANSWER.—Louis Lewin's book "Phantastica" (New York, E. P. Dutton & Co., 1931) may give satisfactory information on cannabis indica. Authoritative discussion of the action of cannabis as well as alcohol may be found in such books on pharmacology as that of Torald Sollmann (Philadelphia, W. B. Saunders Company). In "The Treatment of Epilepsy," by Fritz B. Talbot (New York, Macmillan Company, 1930), a good book on the subject, the author says: "Our understanding of the mode of action of the ketogenic diet may be summarized as follows: Whether the dehydration associated with the ketogenic regimen is the important therapeutic factor or whether the effectiveness of ketosis is to be ascribed to some unknown or unrecognized factor has not yet been demonstrated. About all that can be said therefore in conclusion is that the ketogenic diet appears to be the most effective form of the dietetic treatment of epilepsy."

DIET IN KIDNEY STONES

To the Editor:—Recently a man, aged 33, consulted me regarding kidney stones, which he has been passing intermittently for the past five years. The stones are small and the chemical analysis indicates calcium oxalate, calcium phosphate and calcium carbonate. Will you please give me information regarding diet in such cases. He has not been taking soda and has no stomach disorder. His general health is excellent.

RADFORD F. PITTAM, M.D., Kansas City, Mo.

ANSWER.—The most important item in the diet is an abundance of water, at least half a gallon each day. The oxaluria requires a restriction of those foods which are rich in oxalates, most especially spinach, potatoes, beets, beans, endive, rhubarb, tomatoes, figs, plums, currants, strawberries, cocoa, chocolate and tea. The tendency to precipitation of calcium phosphate and carbonate should be antagonized by increasing the acidity of the urine, most especially by a diet rich in meat, eggs and cereals, with but little of fruit and vegetables, and no milk, as this is rich in calcium.

Medical Examinations and Licensure

COMING EXAMINATIONS

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOGY: *Written examination for Group B applicants* will be held in various cities throughout the country, March 14. *Oral examination for Group A and B applicants* will be held in Kansas City, Mo., May 11-12. *Applications for written examination should be filed with the secretary before Jan. 15.* Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: Written examination and review of case histories of Group B applicants will be held in various cities of the United States and Canada, March 28. *Applications must be filed not later than February 28.* Oral, clinical and pathological examination of all candidates will be held in Kansas City, Mo., May 11-12. *Applications must be received not later than April 1.* Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY: Kansas City, Mo., May 11 and New York, Oct. *All applications and case reports must be filed sixty days before date of examination.* Asst. Sec., Dr. Thomas D. Allen, 122 S. Michigan Ave., Chicago.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: St. Louis, Jan. 11. Sec., Dr. Fremont A. Chandler, 180 N. Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: Kansas City, Mo., May 9. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PEDIATRICS: Kansas City, Mo., May 9. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: New York, Dec. 30. Sec., Dr. Walter Freeman, 1726 Eye St., N. W., Washington, D. C.

COLORADO: Denver, Jan. 7. Sec., Dr. Harvey W. Snyder, 422 State Office Bldg., Denver.

CONNECTICUT: *Basic Science.* New Haven, Feb. 8. *Prerequisite to license examination.* Address State Board of Healing Arts, 1895 Yale Station, New Haven.

DISTRICT OF COLUMBIA: Washington, Jan. 13-14. Sec., Commission on Licensure, Dr. George C. Ruhland, 203 District Bldg., Washington.

HAWAII: Honolulu, Jan. 13-16. Sec., Dr. James A. Morgan, 48 Young Bldg., Honolulu.

ILLINOIS: Chicago, Jan. 28-30. Superintendent of Registration, Department of Registration and Education, Mr. Homer J. Byrd, Springfield.

MINNESOTA: *Basic Science.* Minneapolis, Jan. 7-8. Sec., Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis. *Medical.* Minneapolis, Jan. 21-23. Sec., Dr. Julian F. Du Bois, 350 St. Peter St., St. Paul.

NATIONAL BOARD OF MEDICAL EXAMINERS. *Parts I and II.* Feb. 12-14, May 6-8, June 22-24, and Sept. 14-16. *Part III* tentatively scheduled as follows: Chicago, Jan. 7-9 and New York, Jan. 13-15. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

NEBRASKA: *Basic Science.* Omaha, Jan. 14-15. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NEVADA: *Reciprocity.* Carson City, Feb. 3. Sec., Dr. Edward E. Hamer, Carson City.

NEW YORK: Albany, Buffalo, New York and Syracuse, Jan. 27-30. Chief, Professional Examinations Bureau, Mr. Herbert J. Hamilton, 315 Education Bldg., Albany.

NORTH DAKOTA: Grand Forks, Jan. 7-10. Sec., Dr. G. M. Williamson, 4½ S. 3d St., Grand Forks.

OREGON: Portland, Jan. 7-9. Sec., Dr. Joseph F. Wood, 509 Selling Bldg., Portland.

RHODE ISLAND: Providence, Jan. 2-3. Dir., Department of Public Health, Dr. Edward A. McLaughlin, 319 State Office Bldg., Providence.

SOUTH DAKOTA: Pierre, Jan. 21-22. Dir., Division of Medical Licensure, Dr. Park B. Jenkins, Pierre.

WASHINGTON: *Basic Science.* Seattle, Jan. 9-10. *Medical.* Seattle, Jan. 13-15. Dir., Department of Licenses, Mr. Harry C. Huse, Olympia.

WISCONSIN: Madison, Jan. 14-16. Sec., Dr. Robert E. Flynn, 410 Main St., La Crosse.

Maryland June Examination

Dr. John T. O'Mara, secretary, Board of Medical Examiners of Maryland, reports the written examination held in Baltimore, June 18-21, 1935. The examination covered 9 subjects and included 90 questions. An average of 75 per cent was required to pass. One hundred and fifty-five candidates were examined, 135 of whom passed and 20 failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
George Washington University School of Medicine	84, 84.3, 86.4, (1935) 77.6, 78.4, 81.3, 84, 87.7	(1934)	80.7,
Georgetown University School of Medicine	81.1, 81.3, 82.6, (1935) 77.1, 79.6	(1934)	75.6,
Howard University College of Medicine	(1934) 75.8, 83.2, (1935) 75.5	(1933)	77.5,
Johns Hopkins University School of Medicine	(1933) 81.1, 84.1, 86.4, (1934) 82.4, 83.1, 85.5, 86.2, (1935) 75.1, 78.3, 79.2, 79.3, 79.6, 79.6, 79.7, 80.3, 80.4, 80.6, 80.6, 81, 82.1, 82.2, 82.3, 83, 83, 83.5, 83.5, 83.6, 83.6, 83.6, 83.8, 84.3, 84.4, 84.5, 84.7, 84.8, 85.7, 85.7, 85.8, 86.1, 86.3, 86.5, 86.5, 86.6, 86.6, 86.8, 87.3, 87.3, 87.4, 88.5, 88.5, 89.1, 89.7, 91.7	(1931)	79,
University of Maryland School of Medicine and College of Physicians and Surgeons	(1932) 78.2, (1933) 86.4, (1934) 79.2, 81.7, (1935) 78.1, 79.3, 79.7, 80.4, 81.2, 81.8, 82, 82.1, 82.4, 82.6, 82.7, 82.8, 83, 83.1, 83.5, 84.1, 84.1, 84.1, 84.3, 84.5, 85.2, 85.2, 85.4, 85.5, 85.6, 85.6, 85.8, 85.8, 86.2, 86.2, 86.4, 86.4, 86.5, 86.7, 87.1, 87.1, 87.6, 87.6, 87.6, 87.8, 87.8, 87.8, 88.1, 88.2, 88.7, 88.7, 89, 89.1, 89.1, 90.8	(1931)	82.7,
University of Rochester School of Med	(1930) 81.7,	(1933)	77
Duke University School of Medicine		(1932)	79.4
University of Pennsylvania School of Medicine		(1934)	86
University of Toronto Faculty of Medicine		(1928)	90.5
Regia Università degli Studi di Bologna. Facoltà di Medicina e Chirurgia		(1929)	80.3*
Regia Università di Napoli. Facoltà di Medicina e Chirurgia	(1931) 80.8,	(1933)	78

School	FAILED	Year Grad.	Number Failed
Georgetown University School of Medicine		(1932), (1934, 6)	7
Johns Hopkins University School of Medicine		(1932)	1
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin		(1932)*	1
Regia Università degli Studi di Bologna. Facoltà di Medicina e Chirurgia		(1931),* (1934)*	2
Regia Università degli Studi di Padova. Facoltà di Medicina e Chirurgia		(1934)*	1
Regia Università degli Studi di Palermo. Facoltà di Medicina e Chirurgia		(1929)*	1
Regia Università degli Studi di Roma. Facoltà di Medicina e Chirurgia		(1932), (1933, 2), (1934)*	4
Regia Università di Napoli. Facoltà di Medicina e Chirurgia		(1923), (1928)*	2
Universität Basel Medizinische Fakultät		(1934)*	1

Fourteen physicians were licensed by reciprocity and 6 physicians were licensed by endorsement from February 12 through July 26 after an oral examination. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
George Washington University School of Medicine		(1912)	Dist. Colum.
Emory University School of Medicine		(1926)	Georgia
Indiana University School of Medicine		(1925)	Dist.Colum., (1929) Indiana
Jefferson Medical College of Philadelphia		(1918)	New Jersey, (1930), (1933) West Virginia
University of Pennsylvania School of Medicine		(1931)	N. Carolina
Meharry Medical College		(1934)	Tennessee
Medical College of Virginia		(1924)	Virginia, (1929) W. Virginia
University of Virginia Department of Medicine		(1933, 2)	Virginia
Dalhousie University Faculty of Medicine		(1924)	W. Virginia

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
College of Medical Evangelists		(1935)	N. B. M. Ex.
Georgetown University School of Medicine		(1934)	N. B. M. Ex.
Johns Hopkins University School of Medicine		(1933, 2)	N. B. M. Ex.
University of Maryland School of Medicine and College of Physicians and Surgeons		(1929)	N. B. M. Ex.
Washington University School of Medicine		(1931)	N. B. M. Ex.

* Verification of graduation in process.

Michigan June Examination at Ann Arbor

Dr. J. Earl McIntyre, secretary, Michigan State Board of Registration in Medicine, reports the written examination held at Ann Arbor, June 11-13, 1935. The examination covered 14 subjects and included 100 questions. An average of 75 per cent was required to pass. One hundred and twenty-seven candidates were examined, 126 of whom passed and 1 failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists		(1935)	78.3, 82.5, 83.4
University of Colorado School of Medicine		(1934)	81.1
Loyola University School of Medicine		(1935)	79.4, 86.3*
Northwestern University Medical School		(1934)	83, (1935) 83.1,* 83.3
Rush Medical College		(1935)	82.1,* 85.2†
School of Medicine of the Division of the Biological Sciences		(1932)	84.1
Harvard University Medical School		(1932)	87, (1933) 82.9,* 83.8, 85.6,* 86.7*
Detroit College of Medicine and Surgery		(1933)	84.5*
University of Michigan Medical School		(1930)	81.4,* (1932) 81.6,* 83, (1933) 83.2, (1934) 84, (1935) 80.2,* 80.4,* 80.8,* 80.8,* 81.1,* 81.4,* 81.4,* 81.4,* 81.5,* 81.6,* 81.9,* 81.9,* 81.9,* 82,* 82,* 82,* 82.2,* 82.3,* 82.3,* 82.3,* 82.4,* 82.4,* 82.4,* 82.4,* 82.5,* 82.5,* 82.7,* 82.7,* 82.7,* 82.7,* 82.9,* 83,* 83,* 83.1,* 83.1,* 83.2,* 83.3,* 83.3,* 83.4,* 83.5,* 83.5,* 83.5,* 83.5,* 83.6,* 83.6,* 83.6,* 83.6,* 83.7,* 83.8,* 83.8,* 83.8,* 84,* 84,* 84,* 84,* 84,* 84.1,* 84.2,* 84.2,* 84.2,* 84.4,* 84.4,* 84.4,* 84.5,* 84.6,* 84.6,* 84.6,* 84.7,* 84.7,* 84.8,* 84.8,* 84.8,* 85,* 85,* 85,* 85.1,* 85.1,* 85.2,* 85.2,* 85.5,* 85.7,* 85.8,* 86,* 86,* 86.1,* 86.4,* 87.2*
University of Nebraska College of Medicine		(1934)	84.6*
New York Homeopathic Medical College and Flower Hospital		(1935)	86.4*
University of Buffalo School of Medicine		(1934)	85.5
University of Rochester School of Medicine		(1935)	83.2*
University of Oregon Medical School		(1933)	83.4
Vanderbilt University School of Medicine		(1933)	83.8*
Marquette University School of Medicine		(1935)	81.9, 84.5
University of Manitoba Faculty of Medicine		(1932)	83.3
McGill University Faculty of Medicine		(1930)	79.5,* (1934) 80.5,* (1935) 82.2*
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin		(1926)	82.8,‡ (1929) 83.2‡
Licentiate of the Royal College of Physicians of Ireland and of the Royal College of Surgeons of Ireland		(1923)	85.8*
Université de Genève Faculté de Médecine		(1931)	84.2

School	FAILED	Year Grad.
Hamburgische Universität Medizinische Fakultät, Hamburg		(1922)

* License has not been issued.
† This applicant has completed the medical course and will receive his M.D. degree on completion of internship. License has not been issued.
‡ Verification of graduation in process.

Book Notices

Paying Through the Teeth. By Bissell B. Palmer, D.D.S., F.A.C.D. Cloth. Price, $2. Pp. 297, with 9 illustrations. New York: Vanguard Press, 1935.

The subtitle of this book, "A Critical Analysis of Dental Nostrums," describes in a sentence the character and scope of the work. The book does for the dental field what "Nostrums and Quackery," published by the American Medical Association, does for the medical field: It gives names and calls a spade a spade; it gives the lay public sound and definite information regarding nostrums sold in the dental field.

Dr. Palmer, while giving due credit to the American Dental Association and, where necessary, to the American Medical Association, for the factual data presented in his book, does not attempt to belittle either of these great organizations. It is true that in one place he does criticize a group of advertisements that appeared in THE JOURNAL, although admitting that THE JOURNAL is "ordinarily most circumspect" in its advertising. Curiously enough, Dr. Palmer fails to bring out what we believe was a fact: that the official journal of the national dental organization carried the same advertisements.

"Paying Through the Teeth" should and will, we believe, do a very useful piece of educational work. Dr. Palmer is of the opinion that the vigorous action of the American Medical Association against the "patent medicine" evil resulted in many concerns in the "patent medicine" group turning their attention to the marketing of dental nostrums, for, as the author so well brings out, the American dental profession, until comparatively recently, made no attempt to protect the public against dental frauds. Dr. Palmer falls into the common error of confusing the American Medical Association's Council on Pharmacy and Chemistry with the Association's Bureau of Investigation. The Council does not concern itself with those cruder proprietaries that are commonly called "patent medicines"; it confines its activities largely to the proprietary remedies that are sold, nominally, at least, for the use of the medical profession for prescription purposes. It is the Association's Bureau of Investigation that has carried on a campaign for more than a quarter of a century against the crude nostrums colloquially called "patent medicines."

Dr. Palmer does well to bring out as he does in chapter 13 the pernicious commercial influences that have attempted to control the dental profession and which apparently still wield considerable power. His profession is having the same fight to overcome the commercial domination of dentistry that the medical profession, through the American Medical Association, had to overcome a similar domination in the medical field. The thoughtful members of the medical profession who are familiar with the facts will agree with Dr. Palmer in his statement that "the dental profession has gone far, and is steadily progressing, toward acceptance of its full duty to protect the public against the use of nostrums, and against the impositions and frauds of dishonest advertising."

"Paying Through the Teeth" is a good book for the physician to have in his reference library, for it contains in easily available form a vast amount of information on tooth pastes, tooth powders, mouth washes, pyorrhea remedies and similar preparations. The book has an excellent index.

Basic Problems of Criminology. By Professor Olof Kinberg, M.D. Boards. Pp. 436. Copenhagen: Levin & Munksgaard, 1935.

Professor Kinberg is a leader in the study of medical jurisprudence with particular reference to Sweden and to the insane. For almost thirty years he has been studying the problems of criminal psychiatry, and his shorter writings are known in this country. The present work is a massive, rather thorough study of criminal "responsibility," for which term the author prefers an obsolescent term "imputability." The volume opens with a historical introduction to the subject of psychiatric criminology which is of much value because it supplements such American works as those of Weihofen and Glueck (which confine themselves to English and American law) by presenting the Teutonic genesis of the subject. While many legal philosophers have discussed causes of crime, Kinberg presents a new philosophical approach. He devotes a good portion of the

historical part of the book to the development, from the classical period to the present, of the concepts of blame and punishment. About the last three fifths of the work is devoted to a careful analysis of the causes of crime, the situational picture surrounding crimes and criminals, and the attitude taken toward the whole subject by various criminological writers. To the American criminal psychiatrist the author's analysis of the criminal's mental processes and the causation of his acts may seem to be a rehash of already published criminological philosophy; still it is excellently done and European sources have been explored which tend to validate and agree with much American material previously needing confirmation. Kinberg is not, of course, down to date in his knowledge of criminology in this country, for much of the best work, like that being done by the Illinois state criminologist, is unpublished or only recently has been put into print. For a foreign publication in English, the style is satisfactory and in some places makes excellent reading. This volume belongs in the library of every potential or actual forensic psychiatrist.

A Textbook of Physiology. By William D. Zoethout, Ph.D., Professor of Physiology in the Chicago College of Dental Surgery (Loyola University). Fifth edition. Cloth. Price, $4. Pp. 694, with 271 illustrations. St. Louis: C. V. Mosby Company, 1935.

This well known textbook has been extensively rewritten in regard to endocrinology, nutrition and neurophysiology. The book is suitable for intermediate courses in physiology and should be intelligible to students with little previous knowledge of anatomy or biochemistry. There is a great deal of reliable information in the volume, although some of it has been too greatly condensed to be readily grasped. Occasionally it is difficult to agree with the author's choice of interpretations. For example, although he says that Hering's theory of color vision is less commonly accepted than Helmholtz's theory, he describes only the former. The physiology of the circulation occupies ninety pages, yet there is no mention of the electrocardiogram. A paragraph is devoted to the "staircase" phenomenon and one to tetanus in heart muscle. An incomprehensible picture of Dudgeon's sphygmograph, among other illustrations of obsolete apparatus, might well be eliminated from future editions. For a textbook in physiology there would not seem to be need for six semidiagrammatic illustrations of the mammalian heart to show the direction of blood flow and the function of the valves. There is no mention of the carotid sinus reflex mechanism. It is obvious from the abundance of anatomic illustrations that the book is intended for nonmedical students. A glossary adds considerably to its value for such students. As a relatively up to date treatment of the subject it can be highly recommended to the intermediate student group.

Gastritis and Its Consequences. By Knud Faber, M.D., LL.D.E., F.R.C.P.E.Hon., Professor of Internal Medicine in the University of Copenhagen. Cloth. Price, $3. Pp. 119, with 48 illustrations. New York & London: Oxford University Press, 1935.

This little monograph presents the views of Dr. Knud Faber, based solely on his personal experience with gastritis over a period of forty years. There are three parts, the first on acute and chronic gastritis, the second on gastritis and hyperacidity, and the third on gastritis and anacidity. The subject of gastritis is an interesting one in that about thirty years ago the term was a diagnostic one to be frowned on for many years and to reappear recently as the result of examination of the stomach itself by direct vision, gastroscopy, and of the tissues removed by resection of the stomach for ulcer or carcinoma. The author's method of immediate postmortem, intragastric injection of 4 per cent solution of formaldehyde has made it possible to obtain tissues that have not undergone lytic degeneration and to report the true story of what he thinks gastritis really is. This work has been done by many others, whose conclusions are in accord with the author's. Tracing the condition from simple gastritis with slight or no dyspeptic symptoms and few local changes, he carried the work through the stages of acute and chronic gastritis and showed that chronic gastritis is frequently the results of repeated or acute gastritis. It may be of the erosive or pangastritic and atrophic type, the latter being the form in which anacidity is most common. Gastritis with hyperacidity may be the forerunner of peptic ulcer, is generally associated with it, and not infrequently may give rise to the symptoms characteristic of ulcer, even hemorrhage without an ulcer being found on roentgen examination or at operation. The small acute ulcers that are often seen in the picture of severe gastritis may be the forerunner of the chronic peptic ulcer. The author says that the causes of anacidity are veiled in indefinite beginnings and that in his experience gastritis is always present wherever anacidity is found. He does not believe in the constitutional factor as a cause of anacidity, as Hurst does. The frequency of the occurrence of low or anacid states in the course of acute infections and intoxications the existence of which may have been forgotten, the many opportunities for the development of gastritis in the course of a lifetime from infancy to late adulthood, the tendency either to forget or to overlook trivial disturbances, are all sufficient reasons for postulating the presence of gastritis at some time or other which subsequently becomes severe enough to cause anacidity, Pyloric gastritis does but cardiac does not produce anacidity. The anacidity late in life looked on as normal is in the author's experience the result of gastritis; likewise the anacidity that may be the precursor and is always the accompaniment of pernicious anemia. The rare return of gastric acidity in this condition is the result of a recession of pyloric gastritis. Hypochromic anemia and anacidity may bear the same relationship. One cannot digress into a discussion with the author, because he makes these observations as his own personal opinion, even though he knows that many disagree with him. It is a well written book, reads well and is worthy of being scanned by any one interested in internal medicine. Attention might be called to the tautologic "X-ray Radiograms" on page 13 and "imitation" for "irritation" on page 32. There is a large bibliography.

Sex Worship and Disease (Phallic Worship): A Scientific Treatise on Sex Worship and Its Influence on Religion and Symbolism, with Special Reference to Disease of the Sexual Organs. By Mason Daugherty, M.D. Cloth. Price, $3.50. Pp. 240, with 21 illustrations. Cleveland, Ohio: The Author, 1935.

There seems to be little reason for the appearance of a book of this sort even though the author does say that it was written for the physician (called a scientific treatise on the title page) and for his friends. Possibly the many lay friends of the physician, seeking information on that always interesting subject, sex, are meant in particular. The doctor is not forgotten, because the unfortunate victim of venereal disease is cautioned against going to an advertising quack, but to an "M.D." [sic]. Chapters on venereal disease, the evils of masturbation, care of the teeth, cancer of the breast, leukorrhea, a recital of Nero's cruelties and a new deal for women alternate in an irregular fashion with discourses on phallic worship, the anatomy of the generative organs, prostitution, marriage customs, birth control and early marriages among the Hindus. The information is too fragmentary to be of any value to a physician or to the layman seeking knowledge. Neither the manner of offering the information nor its literary qualities can recommend it to the intelligent reader.

Prognosis. Volume One. [Reprinted from the Lancet.] Cloth. Price, 10s. 6d. Pp. 372. London: Lancet, Limited, 1935.

This is a companion volume to the previously published series on "Modern Technique in Treatment" and "Clinical Interpretation of Aids to Diagnosis." It contains, as did the others, a collection of articles published week by week in the *Lancet*. To the writing of each article the editorial staff invited those who have watched the progress of large numbers of cases of certain diseases to share this experience with their colleagues in more general practice. The choice seems to have been a happy one in each case, for in every chapter one senses the word authority. "Of the three great branches of clinical science: diagnosis, prognosis and treatment, prognosis is admittedly the most difficult," says Robert Hutchinson. Hence it ought to be studied all the more assiduously. It is, indeed, just as true of prognosis as it is of diagnosis that neither of them can be separated from treatment. The three are merely different aspects of therapy, "if we define this word, in its widest sense: serving the best interests of the sick." Thus says T. A. Ross, in his introduction to the chapter on "Prognosis in Hysteria and Anxiety States": "It is of interest when

reading contributions on the subject of prognosis to note that nearly every author is compelled to make constant reference to treatment. Therapeutics are scoffed at so often that it is gratifying to find that hardly any one is in a position to discuss prognosis helpfully without doing this. It has been made abundantly clear in several articles in this series that in many illnesses prognosis depends not only on the nature of the illness but on the facilities for treatment which can be afforded. There are of course certain conditions such as coryza where whatever is done, it is as near certainty as possible that the patient will become quite well; there are others, like established hydrophobia, where it is almost equally certain that he will die; but for probably a majority of illnesses prognosis depends to a great extent on treatment, and certainly this is true of the two psychoneuroses hysteria and anxiety states." No physician, be he specialist or generalist, can peruse this book without becoming a better doctor than he was.

Human Pathology: A Textbook. By Howard T. Karsner, M.D., Professor of Pathology, Western Reserve University, Cleveland, Ohio. With an introduction by Simon Flexner, M.D. Fourth edition. Cloth. Price, $10. Pp. 1,013, with 461 illustrations. Philadelphia & London: J. B. Lippincott Company, 1935.

The first edition of this textbook appeared in 1926; this, the fourth edition in nine years, represents the efforts of the author "to keep the work wholly abreast of the times." This attempt is apparent in the careful way in which Dr. Karsner has revised the book. Many sections have been completely rewritten, new illustrations added or better ones substituted for previous ones, and the references at the close of each chapter modernized. The chapter on the general pathology of tumors has been rewritten, and much new material has been added to the sections on diseases of the blood, diseases of the nervous system, and the pathology of the ductless glands and of the granulomas. Other subjects have been revised in the light of newer information, making the work much more satisfactory for teachers and advanced students.

Criticism of this book is made difficult by the fact that the author has attempted the impossible object of treating the subjects of general and special pathology in one volume that will be useful to students as well as to advanced workers in the field. He has succeeded better for the latter group than for the former. For beginning students further simplification would make the sections on general pathology more comprehensible. For example, the long paragraphs on pages 129 to 134 are rather confusing to beginners. Future editions might well include a general chapter on parasitic diseases written from the pathologic point of view. The book as a whole, however, will continue to serve and to inspire all students of pathology even more completely than it has in the previous editions. American pathologists may well be proud of Dr. Karsner's achievements in this textbook.

Psicologia social. Pelo Professor Raul Briquet, catedrático da faculdade de medicina da Universidade de São Paulo. Paper. Pp. 265, with 10 illustrations. Rio de Janeiro, São Paulo & Bello Horizonte: Livraria Francisco Alves: Paulo de Azevedo & Cia, 1935.

This book is a modern presentation of some of the more superficial facts of social psychology. It is somewhat less scientific and less exact than most American books, such as those of Bernard and Allport, and consists largely of quotations from authors on the various subjects discussed. The style is simple if one reads Portuguese, but there seems to be no reason for any American reading the present volume. The most important contributions discussed in it are those of Americans and are well known to the majority of people interested in social psychology. Its chief source of interest, however, is in its approach. It consists of two parts; the first is a general discussion covering such topics as the importance of biology and psychology and sociology to the subject in general. Under the topic of psychology is included behaviorism, gestalt, and the "laws of human nature." The way these matters are taken up indicates that there are some students in Brazil who follow the American psychologists closely. The second part deals with special topics; first the psychic factors and secondly social life. The usual topics are considered here, and even though the book is for South American consumption the topic of revolution is not overemphasized. The value of this book to medical men is obscure.

The Principles and Practice of Hygiene. By Dean Franklin Smiley, A.B., M.D., Professor of Hygiene in Cornell University, Adrian Gordon Gould, Ph.B., M.D., Assistant Professor of Hygiene in Cornell University, and Elizabeth Melby, M.A., R.N., Assistant Professor, Yale University School of Nursing. Second edition. Cloth. Price, $2.50. Pp. 495, with 96 illustrations. New York: Macmillan Company, 1935.

This useful textbook for nurses was first published in 1930. In the previous edition the authors limited their discussion to matters relating to personal and individual hygiene. In the new edition they have made little change but have simply added a section on community sanitation. They have not been successful in condensing this comprehensive subject within some seventy-eight pages. The major titles of the material that is considered are (1) water supplies and their purification, (2) prevention of food-borne infections, (3) combating the hazards of the lower animals, insects and soil, and (4) home sanitation. All these subjects are discussed inadequately, while much equally important material is given no consideration whatever. The chapter on combating the hazards of the lower animals, insects and soil is a heterogeneous mixture of subjects that have little interrelationship. The chapter on home sanitation is perhaps the least adequate of the group. It probably would have been more advantageous if the authors had written a separate book on the subject "Community Sanitation" rather than attempt to abridge and condense this information within the pages of their original volume.

Anemias y alimentación: El principio antianémico del hígado y los factores cualitativos de los alimentos (vitaminas, aminoácidos, hierro y cobre). Por José Sánchez Rodríguez. Tesis doctoral premiada por la Academia Nacional de Medicina en 1935. Prólogo de Gregorio Marañón. Paper. Price, 12 pesetas. Pp. 170, with 22 illustrations. Madrid: Cruz y Raya, 1935.

The book is divided into two parts, theoretical and experimental. In the first part the chemistry of the red blood corpuscle and the factors that control the level of hemoglobin are considered. Anemias are classified as being caused by (1) insufficiency (lack or defective utilization) of the nutritive materials (iron, amino acids), (2) changes in the hematopoietic organs (toxic, infectious, metabolic, mechanical), (3) alterations in the catabolism of the blood pigment (toxic hemolytic, infectious hemolytic) and (4) alterations in the regulating factors (antianemic principle of liver, hormones, vitamins, copper). The importance of alimentation in the cause and correction of anemia is stressed. In studying the composition of liver extract to throw light on the qualitative factor of the defective alimentation of the antianemic substance in pernicious anemia, Rodriguez used a European preparation of liver that apparently differed in many respects from the preparation in use in America. He found no appreciable amounts of iron, copper, hydroxyproline, betahydroxyglutamic acid, or vitamins A, B_2, C, D or E. The author therefore questions Strauss and Castle's suggestion that B_2 is the "extrinsic factor" in the production of antianemic substance, and he also eliminates B_1 as a factor. Both of these he finds in gastric mucosa, although he found no B_2 in normal gastric secretion. The hematopoietically active principle of liver is considered as a definite vitamin. There is appended a bibliography of 502 articles, including a large number from American literature.

Annual Review of Biochemistry. Edited by James Murray Luck, Stanford University. Volume IV. Cloth. Price, $5. Pp. 639. Stanford University, California: Annual Review of Biochemistry, Ltd., 1935.

This collection of reviews in fields of current interest to biochemists and to others who deal with biochemical problems is now in its fourth year. As in past volumes, investigators from many parts of the world have been chosen to prepare the material on the various subjects; thus this book is truly an international achievement, representing the efforts of thirty-two authors from eight countries. The subjects reviewed in volume IV include permeability; biologic oxidations and reductions; enzymes; chemistry of carbohydrates and glucosides, acyclic constituents of natural fats and oils, proteins and amino acids, sulfur compounds, nucleic acids, purines and pyrimidines, muscle and bacteria; metabolism of carbohydrates, fats, amino acids and proteins, creatine and creatinine, and of brain and nerve; detoxication mechanisms; hormones; choline compounds; vitamins; nutrition; chemical embryology; biochemistry of malignant disease; plant pigments; alkaloids; mineral nutrition

of plants; growth substances of plants; immunochemistry. To review in detail this vast amount of material is obviously not feasible. It is inevitable that the different reviews should vary in quality; some are more critical than others. Despite the shortcomings of a few of them, the book as a whole serves as an admirable introduction to and synthesis of current literature of biochemistry. Although it would undoubtedly add considerably to the difficulty and cost of preparing these annual volumes, it appears that a subject index would greatly enhance their utility as reference books.

Archiv und Atlas der normalen und pathologischen Anatomie in typischen Röntgenbildern. Atlas der normalen Ossifikation der menschlichen Hand. Von Prof. Dr. F. Siegert. Ergänzungsband XLVII, Fortschritte auf dem Gebiete der Röntgenstrahlen. Herausgegben von Prof. Dr. Grashey. Paper. Price, 16 marks. Pp. 43, with 158 illustrations. Leipzig: Georg Thieme, 1935.

This statistical study of the ossification of the hand is based on the author's extensive material and is illustrated by thirty-six excellent plates with 134 roentgenograms of normal hands of both sexes and sixteen roentgenograms of the hands of patients with various pathologic conditions. The author concludes from his observations that ossification takes place earlier in female children than in male but that in both sexes the order of ossification is relatively uniform. Ossification may be of different types in different families, and this fact should be remembered in attempting to distinguish between normal and pathologic conditions. In the author's judgment the tables of Adams showing the relation between the length and the weight of a child are preferable to those of Pirquet.

Laboratory Methods of the United States Army. Edited by James Stevens Simmons, B.S., M.D., Ph.D., Major, Medical Corps, United States Army. Associate Editor: Cleon J. Gentzkow, M.D., Ph.D., Major, Medical Corps, United States Army. Approved by the Surgeon-General of the United States Army. Fourth edition. Fabrikoid. Price, $6.50. Pp. 1,091, with 70 illustrations. Philadelphia: Lea & Febiger, 1935.

Planned originally to aid medical officers during the World War, this volume is now in its fourth edition, much revised and greatly enlarged. In its development many competent workers have given their aid and services, and they are credited in the book for their contributions. The present volume is a complete guide to laboratory methods in medicine, veterinary practice and statistics. Its usefulness can hardly be exaggerated, since it represents the experience of workers handling thousands of specimens under conditions enabling suitable controls. There is a competent index. The tests and methods offered are those usually followed in army work; in many instances only a single method is given although several methods may be available. Thus, there is but a single rough and ready method for blood coagulation and there does not appear to be any method described for counting blood platelets. Wassermann and Kahn tests are given in great detail with complete theoretical considerations. For the determination of blood sugar, the Folin-Wu method is described. Notwithstanding its minor deficiencies, the work is still a vade mecum in the laboratory field.

Ear Exostoses. By Aleš Hrdlička, Curator, Division of Physical Anthropology, U. S. National Museum. Smithsonian Miscellaneous Collections. Volume 93, number 6. Publication 3296. Paper. Price, 50 cents. Pp. 100, with 13 illustrations. Washington, D. C.: Smithsonian Institution, 1935.

The subject of ear exostoses does not occupy a prominent place in otology. Curiously enough, however, the names of a number of famous otologists are associated with studies of these peculiar formations. For the anthropologist too they hold peculiar interest. The author has written a monograph of more than academic interest. He discusses this subject as completely as can be, with literature, observations old and new, and the detailed data as to the age, sex, frequency of the occurrence, and etiology, and in a general discussion sums up the available information. He concludes that exostoses of the ear are abnormalities rather than a disease, arising from the free ends of the tympanic ring. They occur chiefly in later adolescence and early adult life. They are seen in all races. The otologist whose interest in things concerning the ear is not limited to the happenings of everyday practice will find this authoritative monograph absorbing reading.

Incompatibilités pharmaceutiques. Par le Prof. A. Goris, director de la pharmacie centrale des hôpitaux, et A. Liot, adjoint au directeur de la pharmacie centrale des hôpitaux. Paper. Pp. 140, with 4 illustrations. Paris: Librairie E. Le François, 1935.

The authors are right in their idea that it is time a newer book on incompatibilities was written, as the only two little books on the subject (Ruddiman's of 1908 and Hagers' of 1907) are now quite out of date. One looks in vain in those relatively old books for information on the incompatibilities of many of the extensively used newer remedies. For the French-reading physician therefore this book will "fill a long-felt want." An English book on incompatibilities is just about due.

Medicolegal

Malpractice: Negligent Treatment of Fracture.—The plaintiff fractured both bones of his right forearm. The defendant reduced the fractures, using only one splint. The bones did not stay in alinement and three times successively within a week the defendant attempted a resetting, each time using only one splint. A substantial permanent deformity and loss of function of the arm resulted and the plaintiff sued the defendant, obtaining judgment in the trial court. The defendant appealed to the Supreme Court of Minnesota.

The whole issue, said the Supreme Court, was whether, in connection with the splint he did use, the defendant should have applied another or posterior splint to keep the bones in place. The failure to use the second splint was improper practice, according to the medical testimony for the plaintiff. The defendant was not a very good witness for himself, the court said. When asked what made the bones "slip all the time," his answer was "I don't know." He testified that the use of a posterior splint "might have" held the bones in proper alinement, yet he insisted that he was "proud of this job." The Supreme Court said that the evidence presented a jury question and the court could find from the record no ground on which it could properly interfere. The judgment for the plaintiff was consequently affirmed.—*Citrowski v. Libert (Minn.), 260 N. W. 297.*

Workmen's Compensation Acts: Traumatic Rupture of Diseased Appendix Compensable.—The employee, during the course of his employment, assisted two fellow employees in carrying a heavy beam up a steep incline. He slipped and fell to his knees and immediately complained of abdominal pain, which persisted and forced him to quit work. An abdominal operation performed about thirty-three hours after the accident disclosed a diseased appendix and peritonitis, with the abdomen "filled with pus." No perforation was located, but an extensive exploration was not done because of the patient's grave condition. The appendix was removed and drainage instituted, but the employee died seven days after the operation. The department of labor and industries denied the claim of the employee's wife for an industrial insurance pension under the workmen's compensation act of Washington, and, from a judgment of the superior court sustaining the department's disallowance, the claimant appealed to the Supreme Court of Washington.

The operating physician stated the causes of death, in the death certificate, as follows: ". . . The remote cause of death Accidental injury. . . . The immediate cause of death Peritonitis and infection causing obstruction also traumatic appendicitis. . . ." An autopsy proved to be of little or no value in locating a possible perforation because of the extent to which the peritonitis had progressed by the time of death and because the embalmer had removed the gas and fluid from the abdominal viscera. It seems to have been conceded that prior to the accident the employee had a painless chronic inflammation of his appendix. The operating surgeon testified that trauma may accelerate chronic appendicitis and cause a rupture or perforation of a weakened diseased appendix. He expressed definitely the opinion that the injury received was the real beginning of the condition which caused the death of the employee. While the evidence was clear, the court said, that the appendix was diseased and in the course of time would

have ruptured without any external pressure, yet there was evidence that the rupture of the appendix was accelerated by the injury. In view of this evidence, said the court, a rule laid down in *Shadbolt* v. *Department of Labor and Industries,* 121 Wash. 409, 209 P. 683, applies:

> Even though the appendix was diseased and in course of time would have ruptured without any external pressure, if its rupture was accelerated by such pressure, this would constitute an injury.

In the opinion of the Supreme Court, the claimant sustained the burden of proof that the accident suffered by the employee caused or accelerated a rupture of the appendix or intestine and that his death resulted therefrom. The judgment of the superior court was reversed, therefore, with direction to remand the case to the department of labor and industries with instructions to allow the claim.—*Thomas v. Department of Labor and Industries (Wash.), 44 P. (2d) 765.*

Malpractice: Facial Paralysis Following Mastoidectomy.—The physician-defendant, a specialist in diseases of the ear, nose and throat, punctured the plaintiff's ear drum, from which pus was immediately discharged. After observing the patient for four days, he made a diagnosis of mastoiditis and performed a mastoidectomy. The operation resulted in "a degree of facial paralysis." Another physician, who performed a second operation to alleviate the paralysis, found that the facial nerve had been injured. This operation improved the facial paralysis, but return of function was not complete. The plaintiff then sued the physician-defendant. From a judgment against him, the physician-defendant appealed to the Supreme Court of Washington.

The physician-defendant contended that he was not negligent in performing the operation but that during the operation the facial nerve was exposed, as the result of necrosis of the protecting bone, and somehow subjected to injury. Such necrosis, he said, could set in within four days after the onset of infection. The plaintiff argued that infection had not existed for a sufficient time to cause such necrosis and that if the operation had been performed skilfully the facial nerve would not have been injured. The physician who performed the second operation testified that two weeks to a month in an average case of mastoiditis, and never less than eight days, was required for an infection in the middle ear to spread into the mastoid and produce the necrosis in question. The plaintiff testified that the physician-defendant told her that he had made a mistake and had cut the nerve, saying nothing at the time about any necrosis or crumbling of the bone. The physician-defendant denied having made this statement and testified "I told her that during the operation I had accidentally uncovered the facial nerve, and that I did the best I could under the circumstances I had to deal with, and that was what had happened. . . ." There was sufficient evidence, said the Supreme Court, to justify the jury in finding that the time between the detection of infection and the operation was insufficient for such necrosis to have set in. It was not contended that the physician-defendant adopted an erroneous method of operating or that the operation which he performed was not proper and necessary. The contention was that the operation was performed in a negligent manner. The distinction between the two classes of cases involving negligence on the part of physicians is pointed out in *Swanson* v. *Hood,* 99 Wash. 506, 170 P. 135, wherein it was said:

> But there is an obvious distinction between a claim of negligence in the choice of methods of treatment and a charge of negligence in the actual performance of the work or treatment after such choice is made. As to the first, the charge is refuted as a matter of law by showing that a respectable minority of expert physicians approved of the method selected thus taking the case from the jury. As to the second, a charge of negligent performance, where there is any evidence tending to show such negligence, the case is for the jury, as in other cases of negligence, whenever upon the evidence the minds of reasonable men might differ. . . .

The record in the present case, said the Supreme Court, contains substantial evidence to support the jury's finding that the operation was negligently performed. There was no testimony to the effect that in operations similar to the one here involved the facial nerve is frequently injured. The evidence went no further than to indicate that such injuries occasionally occur. The plaintiff was not required to prove negligence by direct and positive evidence; it was only necessary that a chain of circumstances be established from which negligence was reasonably and naturally inferable. The jury had a right to take into consideration the fact that a second operation was necessary in order to correct the condition resulting from the first operation.

The Supreme Court could find no reversible error and therefore affirmed the judgment of the trial court for the plaintiff.—*Marlowe v. Patrick (Wash.), 44 P. (2d) 776.*

Malpractice: Roentgen Burns; Accrual of Right of Action.—The plaintiff in 1928 sustained a roentgen burn as a result of treatments administered by the defendant, for the purpose of preventing conception. According to the complaint, the physician minimized the severity of the burn and continued to attend the patient until 1932, when, the burn having gradually become worse, he suggested that she seek relief from another physician. Claiming permanent injury as a result of the burn, the patient and her husband in 1934 sued the defendant. The trial court sustained the defendant's demurrer to the complaint, on the ground that the suit was barred by the three year statute of limitations. The plaintiffs thereupon appealed to the Supreme Court of Washington.

In Washington, said the court, it has been held in several malpractice cases arising against attorneys that the cause of action is founded on a breach of duty arising out of contract and that the three year statute of limitations is applicable. In the present case, six years elapsed between the infliction of the burn and the commencement of suit. The plaintiff contended, however, that her action was not barred by the statute of limitations because (1) the defendant fraudulently concealed from her the severity of the burn, and (2) the statute did not begin to run until 1932, when the defendant's professional services were terminated. With respect to the first contention, the Supreme Court said that the decision in the case of *Cornell* v. *Edsen,* 78 Wash. 662, 139 P. 602, was controlling. In that case, wherein it was alleged that an attorney had wrongfully dismissed an action and had concealed that fact from his client, it was urged that the concealment tolled the statute of limitations. In holding to the contrary, the court in that case said, in part:

> The action is plainly one based upon a breach of duty growing out of the relation existing between the parties, a contractual relation which calls for a full disclosure; and when by reason of the failure to make a full and complete disclosure, or the withholding or concealment of facts which should have been disclosed, loss is suffered, there is a breach of duty, and for such breach an action will lie. But, like any other action founded upon a breach of duty imposed either by law or contract, the action arises out of the breach, and the statute of limitations begins to run from the time of the breach and not from the time of its discovery. . . . In this case the duty is one growing out of the relation between the parties, and that relation is one based upon contract. The relation, it is true, is fiduciary, but that does not disturb the fact that it is contractual, and that a cause of action based upon the breach of the contract accrues when the contract is violated and not when the violation is discovered.

With respect to the contention that the statute of limitations did not begin to run until after the defendant discontinued his services, the court again referred to a prior decision, *Jones* v. *Gregory,* 125 Wash. 46, 215 P. 63. In that case the plaintiff, alleging that she suffered loss by the negligence of her attorneys, contended that the statute of limitations did not begin to run until the services of the attorneys had ceased. In disposing of that contention, the court said:

> The contention made in appellant's behalf seems to be that in some way the starting of the running of the statute was stayed by the efforts put forth by respondents as counsel for appellant, looking to the setting aside of the original decree of distribution and the entering of another decree of distribution, awarding to her all of the property of the estate. We are quite at a loss to understand how such action on the part of respondents, or how such subsequent proceedings in court, looking to the setting aside of the original decree of distribution, could stay the starting of the three-year statute of limitations. Surely whatever respondents did, resulting in damage to appellant, occurred not later than the entering of the decree of distribution on December 4, 1918. Manifestly appellant's right of action, if any she ever had, accrued not later than that date. Every act of respondents which could possibly have resulted in the damage claimed to have been suffered by appellant was committed before or upon that date.

In the Jones case, the Supreme Court pointed out, the attorneys, after making their mistake, endeavored to correct it; in

the present case, after the act of malpractice, the defendant continued to treat the plaintiff in an effort to alleviate and correct his first mistake. The gravamen of the present action is the defendant's malpractice in the performance of the service for which he was originally employed. It would be trifling with the facts, the court said, to say that the present action was brought, not for the original injury, but for the defendant's subsequent failure to correct the original wrong. Numerous authorities cited by the plaintiff to support her position related generally to cases in which the physician's employment had relation to an existing injury or malady which the physician was called to treat. In the present case, the court said, the defendant's original employment by the plaintiff was not to cure the roentgen burn but to prevent conception. The defendant's breach of duty to the plaintiff consisted in the negligent manner of his treatment to effect this purpose, and this is the wrong for which the plaintiff seeks recovery.

The Supreme Court therefore concluded that the trial court correctly sustained the defendant's demurrer, and the judgment of dismissal was affirmed.—*McCoy v. Stevens (Wash.), 44 P. (2d) 797.*

Hospitals: Operation of a Municipal Hospital a Governmental Function.—The defendant city of McAllen owned and operated a hospital, supplying hospital care to all persons within the city who were in need of it and charging a fee only to those who were able to pay. The hospital was built by means of a city bond issue and was operated as a part of the city government. The plaintiff, a pay patient, was injured as the result of the negligence of a student nurse employed by the hospital. The plaintiff and her husband sued the defendant city and its insurance carrier. From a judgment in favor of the plaintiff, the city and its insurance carrier appealed to the court of civil appeals of Texas.

A hospital, said the court, constructed and maintained by a city for the principal purpose of conserving the public health, as was the defendant hospital, receiving indigent patients without charge, and applying all money received to expenses, is a charitable institution and is not liable to a pay patient for injuries due to the negligence of an employee. Furthermore, the defendant city operated the hospital in the performance of a governmental function and consequently was not for that reason liable in the present case. Accordingly, the court reversed the judgment of the trial court for the plaintiff.—*City of McAllen v. Gartman (Texas), 81 S. W. (2d) 147.*

Optometry: Corporate Practice of Optometry Illegal; Injunction to Restrain Practice.—The two cases here abstracted hold that corporations may not lawfully practice optometry.

In New York, the Secretary of State refused to accept for filing a proposed certificate of incorporation whereby the corporation was to be authorized, among other things, "to transact and carry on the optical business; to do, render and perform optometrical and oculists' work and services and to engage in the practice of optometry, provided it employs only licensed optometrists to do the work." The plaintiff instituted proceedings in the supreme court of New York to compel the Secretary of State to accept for filing the proffered certificate. The defendant Secretary of State contended that a corporation may not be lawfully formed to practice optometry or to perform "oculists' work and services," even though it employs licensed optometrists to do the work. With this contention, the supreme court agreed. In *Matter of Co-operative Law Co.*, 198 N. Y. 479, 92 N. E. 15, it was held that a corporation may not lawfully practice law in New York. In *People* v. *John H. Woodbury Dermatological Institute*, 109 N. Y. S. 578, 85 N. E. 697, it was held that it was against the policy of the state to permit corporations to practice medicine. Likewise, in *Hannon* v. *Siegel-Cooper Co.*, 167 N. Y. 244, 60 N. E. 597, it was held that a corporation cannot lawfully practice dentistry in New York by employing a licensed dentist to do the work. If, said the supreme court, it is repugnant to the policy of the state to have the professions of medicine, dentistry and law practiced by a corporation, it is equally repugnant to have the profession of optometry practiced by a corporation. The practice of optometry, the court pointed out, may be carried on only by those persons who have complied with the requirements of the statute regulating the practice of optometry as to moral character and educational fitness. It necessarily follows that the right to practice optometry is a personal one and confined to real persons and not to legal entities. A corporation as such cannot meet the requirements of the statute; it cannot have completed a course in a high school or in a university where optometry is taught; it cannot present the necessary certificate of character; it cannot pass a state board examination. In denying the plaintiff's petition, the supreme court concluded:

> The proposed certificate of incorporation provides for the carrying on of the optical business and the rendition and performance of optometrical and oculists' work and services. A corporation is forbidden both by statute and judicial decisions from performing an oculist's work and services, an oculist being a duly licensed physician specializing in the diseases of the eye. While this motion could well be denied on the ground that a corporation may not render oculists' services, I have been requested to base this decision on the question of whether or not a corporation may be organized for the purpose of practicing optometry. I hold that it cannot lawfully be organized for such purpose.

In West Virginia, two licensed optometrists, suing on behalf of themselves and all others similarly situated, obtained an injunction against the defendants, the Buhl Optical Co., a corporation, and the O. J. Morrison Department Store Company, another corporation, prohibiting them from practicing optometry through registered and licensed optometrists. The defendants appealed to the Supreme Court of Appeals of West Virginia.

The defendant optical company maintained an optometry department in the defendant department store, in charge of a licensed optometrist paid by the optical company. A fixed percentage of the gross receipts from this department went to the department store; the remainder went to the optical company. The optometry practice act, said the court, recognizes optometry as a profession and provides that it shall be unlawful for any person to practice optometry in the state who has not been licensed and registered. It requires that applicants shall have attained the age of 21 years, shall be of good moral character and temperate habits, and shall pass specified educational qualifications. A licentiate is forbidden to advertise, practice or attempt to practice "under a name other than" his own. This prohibition, the court said, is certainly antagonistic to the view that a corporation may practice optometry through a licensed optometrist. In holding that a corporation could not lawfully engage in the practice of optometry in West Virginia, the court cited with approval the New York case abstracted above. In a specially concurring opinion, Judge Maxwell said:

> The act precludes all persons not properly registered from practicing optometry. A corporation is a *person*, and in the nature of things it cannot possess the qualifications to practice optometry. A person, individual or corporate, may not do by indirection what he or it is precluded from doing directly.

The decree of the trial court, granting the injunction, was therefore affirmed.—*Stern v. Flynn (N. Y.), 278 N. Y. S. 598; Eisensmith v. Buhl Optical Co. (W. Va.), 178 S. E. 695.*

Society Proceedings

COMING MEETINGS

American Student Health Association, New York, Dec. 27-28. Dr. Harold S. Diehl, University of Minnesota Medical School, Minneapolis, Secretary.

Eastern Section, American Laryngological, Rhinological and Otological Society, Newark, N. J., Jan. 3. Dr. Henry B. Orton, 24 Commerce St., Newark, N. J., Chairman.

Middle Section, American Laryngological, Rhinological and Otological Society, Milwaukee, Jan. 11. Dr. William E. Grove, 324 East Wisconsin Avenue, Milwaukee, Chairman.

Mid-Western Section, American Laryngological, Rhinological and Otological Society, St. Louis, Jan. 15. Dr. Harry W. Lyman, Carleton Building, St. Louis, Chairman.

Society of American Bacteriologists, New York, Dec. 26-28. Dr. I. L. Baldwin, College of Agriculture, University of Wisconsin, Madison, Wis., Secretary.

Society of Surgeons of New Jersey, Jersey City, Jan. 15. Dr. Walter B. Mount, 21 Plymouth St., Montclair, Secretary.

Southern Section, American Laryngological, Rhinological and Otological Society, Jackson, Miss., Jan. 18. Dr. Robin Harris, Lamar Building, Jackson, Miss., Chairman.

Western Section, American Laryngological, Rhinological and Otological Society, Del Monte, Calif., Feb. 1-2. Dr. Carroll Smith, Paulsen Building, Spokane, Wash., Chairman.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Periodicals are available from 1925 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama Medical Association Journal, Montgomery

5: 137-172 (Oct.) 1935

Some Lesser Known Manifestations of Allergy. M. T. Davidson, Birmingham.—p. 137.

Minor Allergic Manifestations. C. K. Weil, Montgomery.—p. 141.

Prostatism: Its Present-Day Diagnosis and Treatment. J. P. Robertson, Birmingham.—p. 144.

American Journal of Cancer, New York

25: 251-500 (Oct.) 1935

Melanoma of Choroid: Prognostic Significance of Argyrophil Fibers. G. R. Callender, Ancon, Canal Zone, and Helenor Campbell Wilder, Washington, D. C.—p. 251.

Inquiry into Origin of Mixed Tumors of Salivary Glands, with Reference to Their Embryonic Interrelationships. P. L. Li and C.-S. Yang, Changsha, China.—p. 259.

*Dysontogenetic Origin of Basal Cell Carcinoma. J. McFarland, E. F. Ciccone and J. Gelehrter, Philadelphia.—p. 273.

Normal Development of Mammary Glands of Virgin Female Mice of Ten Strains Varying in Susceptibility to Spontaneous Neoplasms. W. U. Gardner and L. C. Strong, New Haven, Conn.—p. 282.

Estrous Cycles of Mice During Growth of Spontaneous Mammary Tumors and Effects of Ovarian Follicular and Anterior Pituitary Hormones. E. Allen, A. W. Diddle, L. C. Strong, T. H. Burford and W. U. Gardner, New Haven, Conn.—p. 291.

*Artificial Fever of 111.4 F. as Means of Destroying Cancer in Animal Body. G. Walker, Baltimore.—p. 301.

Photosensitivity of Chick-Embryo Cells Growing in Mediums Containing Certain Carcinogenic Substances. Margaret Reed Lewis, Baltimore.—p. 305.

Atypical and Pathologic Multiplication of Cells Approached Through Studies on Crown Gall. A. J. Riker and T. O. Berge, Madison, Wis.—p. 310.

Differential Mortality from Cancer in White and Colored Population. S. J. Holmes.—p. 358.

Tumors of Peripheral Nerves. C. F. Geschickter, Baltimore.—p. 377.

Dysontogenetic Origin of Basal Cell Carcinoma.—McFarland and his collaborators plotted a number of carefully selected and histologically confirmed cases of basal cell carcinomas from two hospitals on two diagrams of the face in order that their distribution might be studied with reference to their possible dysontogenetic origin through defective concrescence of the embryonal facial fissures as suggested by Glasunow. The observations have been compared with the plottings of other supposed dysontogenetic lesions, sequestration dermoids and mixed tumors, with the result that all three types of lesions are found to conform to about the same anatomic distribution, which is entirely different from that of the more common squamous cell or prickle cell carcinomas. The authors do not believe that their observations settle the question, but they do believe that they support the theory of Glasunow that the basal cell carcinomas are dysontogenetic tumors which originate in imperfections in the closure of the embryonal facial fissures.

Artificial Fever as Means of Destroying Cancer.—Walker found that tumor 256, a scirrhous carcinoma of the mammary gland, was destroyed in vitro at a temperature of 111.4 F. His experiments on the living animal show that, if it were possible to raise the temperature of a tumor-bearing rat up to 111.4 F. and to maintain it at that point for twenty minutes, all the malignant tissues throughout the body could be destroyed. Up to the present, however, exposure to this temperature has proved uniformly fatal. Raising the temperature to 109 F. at repeated intervals does not destroy the tumor nor does it seem to retard the growth. The artificial fever produced by the high frequency apparatus appears to be more damaging than the artificial fever produced by the thermostat. There seems to be something especially injurious in the high frequency method, for in no instance did the animal live as long as the required twenty minutes after the temperature reached 111.4 F. The construction of a large thermostat, in which it would be possible to maintain a temperature of 100 F. with complete saturation of the air with water vapor, might offer a safer method of producing artificial fever than the use of the high frequency apparatus.

American Journal of Syphilis and Neurology, St. Louis

19: 473-622 (Oct.) 1935

Comparative Chemotherapeutic Studies of Arsenoxide (3-Amino-4-Hydroxy-Phenyl-Arsenoxide) and Neoarsphenamine. G. W. Raiziss and Marie Severac, Philadelphia.—p. 473.

*Changes in Technic of Kolmer-Wassermann Test. J. A. Kolmer, Philadelphia.—p. 481.

Some Modifications of Kolmer-Wassermann Test. F. Boerner and Marguerite Lukens, Philadelphia.—p. 489.

Preliminary Study of Thio-Arsene, Disodium Bis-(P-Sulfophenyl) (Acetamidophenyl)-Dithio-Arsenite. C. R. Eckler and H. A. Shonle, Indianapolis.—p. 495.

Clinical Observations on Treatment of Syphilis by Combination of Bismuth Salicylate and New Arsenical Synthetic: Preliminary Report. S. W. Becker and M. E. Obermayer, Chicago.—p. 505.

Therapeutic Value of Thio-Arsene: Clinical Study of Therapeutic Efficiency and Toxicity of Disodium Bis-(P-Sulfophenyl) (Acetamidophenyl)-Dithio-Arsenite, Based on Twenty-Two Hundred and Eighty-Two Injections Administered to Two Hundred and Fifty-One Patients with Syphilis. W. H. Connor and H. C. Shaw, in collaboration with E. A. Levin and R. B. Palmer, Cleveland.—p. 514.

Treatment of Syphilis with New Arsenical Drug (Thio-Arsene). H. M. Robinson and J. E. Moore, Baltimore.—p. 525.

Congenital Syphilis in Children: Results of Treatment in Five Hundred and Twenty-One Patients, Part I. F. R. Smith Jr., Baltimore.—p. 532.

Changes in Technic of Kolmer-Wassermann Test.—Kolmer states that the amounts of serum employed in the Kolmer quantitative complement fixation test for syphilis have been changed to 0.2, 0.1, 0.5, 0.025 and 0.005 cc. with 0.2 cc. in the serum control. In the qualitative test the amounts have been changed to 0.2 and 0.1 cc with 0.2 cc. in the serum control. By using a first dose of 0.2 cc. of serum, the sensitiveness of the reactions has been increased without any increase of nonspecific reactions. The antigen has been improved by reenforcing with acetone-insoluble lipoids. It is used in a dose of 20 instead of 10 antigenic units, which increases the sensitiveness of the reactions while preserving specificity and freedom from falsely positive reactions; the test is otherwise conducted exactly as described originally.

Annals of Otol., Rhinol. and Laryngology, St. Louis

44: 611-912 (Sept.) 1935

Ossification of Cartilages of Larynx and Its Relationship to Some Types of Laryngeal Disease. H. M. Taylor, Jacksonville, Fla.—p. 611.

Osteoma of Nasal Accessory Sinuses. T. E. Carmody, Denver.—p. 626.

Branchial and Thyroglossal Duct Cysts and Fistulas. J. M. Brown, Los Angeles.—p. 644.

Sphenoid Sinus and Sphenopalatine Ganglion as Factors in So-Called Atypical Trigeminal Neuralgia. H. W. Lyman, St. Louis.—p. 653.

*Differential Diagnosis of Enlargement of Lymph Glands of Neck. R. F. Farquharson, Toronto.—p. 662.

Further Study of Effects of Drugs on Ciliary Activity: New Method of Observation in Living Animal. D. M. Lierle and P. M. Moore, Iowa City.—p. 671.

Relationship of Gustatory to Olfactory Systems. L. Felderman, Philadelphia.—p. 685.

Torula Mycosis in Man, with Especial Reference to Involvement of Upper Respiratory Tract: Case Reports. W. D. Gill, San Antonio, Texas.—p. 702.

Cicatricial Atresia of Esophagus. H. L. Kearney, New Orleans.—p. 719.

Paralysis of Larynx: Suggested Explanation of So-Called Continued Median Position of Vocal Cords in Bilateral Paralysis: Consideration of Semon's Law. C. J. Imperatori, New York.—p. 730.

Use of Free Metallic Silver in the Nose. L. S. Powell, Lawrence, Kan.—p. 734.

Differential Diagnosis of Enlargement of Cervical Lymph Nodes.—Farquharson states that the diagnosis of enlargement of cervical lymph nodes is usually made without difficulty on the history and the clinical and hematologic examination alone. Of the swellings affecting only cervical lymph nodes, difficulty is sometimes found in differentiating certain cases of tuberculous adenitis from lymphosarcoma and early Hodgkin's disease. A biopsy is often helpful in these circumstances, but the histologic picture is not always decisive and then the diagnosis may be determined only by the subsequent course of the disease. In patients with generalized involvement

of the lymph nodes one must be careful not to confuse infectious mononucleosis, which is never serious, with acute leukemia, which is always fatal. The differentiation is clearly made by clinical examination and study of the blood picture. The importance of history and clinical examination with a consideration of the blood picture is stressed. The information obtained by histologic examination of the excised gland is often useful but sometimes indeterminate and occasionally misleading. It should be considered together with all the clinical data in the final summing up of difficult cases.

Arch. of Physical Therapy, X-Ray, Radium, Chicago

16: 577-640 (Oct.) 1935

Passive Vascular Exercise for Diseases of Peripheral Vessels: Description of New Device. F. H. Krusen, Rochester, Minn.—p. 581.
*Short Wave Therapy in Pyogenic Skin Infections. T. de Cholnoky, New York.—p. 587.
Analysis of Selective Effects of Short Wave Therapy. C. J. Breitwieser, Pasadena, Calif.—p. 594.
New Type of Vaginal Radium Applicator. H. Swanberg, Quincy, Ill. p. 598.
Range of Penetration of Different Ray Qualities in Radiation Therapy. J. L. Weatherwax, Philadelphia.—p. 600.
Method for Studying Effectiveness of Seven Hundred Kilovolt X-Rays. T. R. Folsom, Lincoln, Neb.—p. 604.
Lincoln General Cancer Clinic: Preliminary Report on Six Hundred Kilovolt Constant Potential Radiation. R. L. Smith, Lincoln, Neb. —p. 608.
Ionization in Hay Fever: Indications, Technic Scope. B. L. Bryant, Cincinnati.—p. 613.

Short Wave Therapy in Pyogenic Skin Infections.—De Cholnoky presents six cases that give a clear picture of the effectiveness of short wave therapy in promoting the healing of furuncles. He has gained the impression that the conservative treatment of furuncles with the aid of short wave therapy is a decided advance over methods employed heretofore. It is a simple method with no attendant dangers and in most cases renders surgery unnecessary. Nevertheless, in appropriate cases it may be necessary to make a small incision in order to hasten the healing process and facilitate evacuation. In his thirty-seven cases of furuncle it was necessary to incise only twice. These were instances in which abscess formation was present which inconvenienced the patient by its size or location. When surgery is employed in conjunction with short wave therapy, it shortens the time of recovery. The author also employed short wave therapy in carbuncles, axillary sweat gland infection and abscesses, erysipelas and erysipeloid. The treatment terminates with good cosmetic results.

Archives of Surgery, Chicago

31: 677-850 (Nov.) 1935

*Pathogenesis of Fibro-Adenosarcoma of the Breast. R. C. Grauer and G. H. Robinson, Pittsburgh.—p. 677.
*Fibro-Adenoma of the Breast During Pregnancy and Lactation. C. S. Moran, Omaha.—p. 688.
*Osteoid-Osteoma: Benign Osteoblastic Tumor Composed of Osteoid and Atypical Bone. H. L. Jaffe, New York.—p. 709.
Mild Acute Appendicitis: Appendical Obstruction. O. I. Cutler, Loma Linda, Calif.—p. 729.
Pilonidal Sinus: Surgical Treatment and Pathologic Structure. H. Rogers and M. G. Hall, Boston.—p. 742.
Pathologic Changes of Diseased Gallbladders: New Classification. E. Andrews, Chicago.—p. 767.
Essential Hyperhidrosis Cured by Sympathetic Ganglionectomy and Trunk Resection. A. W. Adson, W. M. Craig and G. E. Brown, Rochester, Minn.—p. 794.
Osgood-Schlatter's Disease. C. J. Sutro and M. M. Pomeranz, New York.—p. 807.
Congenital Median Cleft of Chin. W. J. Stewart, Columbia, Mo.—p. 813.
Late Subcutaneous Rupture of Tendon of Extensor Pollicis Longus Muscle. B. Lipshutz, Philadelphia.—p. 816.
Intracranial Pressure in Head Injuries. A. A. Zierold, Minneapolis. —p. 823.
Fifty-Eighth Report of Progress in Orthopedic Surgery. J. G. Kuhns, E. F. Cave, S. M. Roberts, J. S. Barr, R. J. Joplin, Boston; J. A. Freiberg, Cincinnati; J. E. Milgram, New York, and R. I. Stirling, Edinburgh, Scotland.—p. 833.

Pathogenesis of Fibro-Adenosarcoma of Breast.—Grauer and Robinson state that the correlation of their experimental observations with the clinical observations establishes fibro-adenosarcoma as a definite clinicopathologic entity and apparently explains the pathogenesis of this type of neoplasm of the breast. The suggestion that this tumor be considered an adeno-fibrosarcoma is a logical one, for it is a generic as well as a descriptive term. Although the term sarcoma implies a highly malignant condition which is not observed in this particular tumor, one must necessarily employ it because of the fibrous nature of the tumor. This raises the point concerning the character of the fibrous tissue which is found immediately around the acini and from which it appears that this tumor arises. The periacinal fibrous tissue is of a looser texture and more embryonic in appearance. Owing to some unexplained factors it overgrows the epithelial elements and produces the alterations in the character of the tumor that were observed in the various transplants. The newer interpretation of the production of various abnormalities of the breast as being an expression of hormone activity appears logical to the authors, but they are reluctant to consider a definite neoplasm, such as fibro-adenoma, as being merely an area of abnormal involution. They consider this especially true since they demonstrated that an adenofibroma of the breast will continue to grow indefinitely during transplantation, whereas breast tissue when transplanted exhibits no neoplastic characteristics.

Fibro-Adenoma of the Breast During Pregnancy.—Moran observed twenty-seven fibro-adenomas removed during pregnancy and lactation or present during that period and removed at varying intervals following the cessation of lactation. The tumors were modified by pregnancy and lactation and the changes produced in them were similar to those occurring simultaneously in the surrounding normal breast. The endocrine factors involved in the development and function of the breast are chiefly discussed, and it is suggested that the changes observed both in the breast and in the fibro-adenoma are of hormone origin.

Osteoid-Osteoma.—Jaffe presents clinical, roentgenologic and pathologic details concerning five cases of a peculiar bone neoplasm. He denotes this lesion osteoid-osteoma and considers it as a distinctive, not heretofore classified, type of bone neoplasm. It is a benign osteoblastic tumor composed of osteoid and atypical bone. In the cases seen it always arose intramedullary in spongy areas. The patients were either adolescents or young adults. The principal complaint was of local pain. As observed by roentgenogram, the pathologic areas were roundish and rather small. Complete eradication resulted in the eventual disappearance of all symptoms. The lesion had no features suggesting an inflammatory origin or origin from an embryonic rest or that it represented an unfamiliar healing stage of a giant cell tumor, localized osteitis fibrosa or cyst. Despite the fact that the lesion of osteoid-osteoma remained small and globuloid in these five cases, the character of the pathologic tissue in the more diffuse tumor previously described by Mayer and the author suggests to him that the latter lesion may be related to the type of tumor under discussion. It also seems likely that the lesion described by Bergstrand as being of embryonic origin and which he regarded as neither an inflammatory process nor a tumor is likewise related to osteoid-osteoma.

Arkansas Medical Society Journal, Fort Smith

32: 93-106 (Nov.) 1935

The Doctor: His Problems: His Duty. F. O. Mahony, El Dorado.—p. 93.
Vaginal Hysterectomy with Original Pryor Clamp. H. D. Wood, Fayetteville.—p. 94.
Strangulated Femoral Hernia with an Unusual Content. O. J. T. Johnston, Batesville.—p. 96.

Georgia Medical Association Journal, Atlanta

24: 353-388 (Oct.) 1935

Surgical Treatment of Thyroid Diseases: Analysis of Two Hundred Consecutive Cases. D. H. Poer, Atlanta.—p. 353.
*Hypothyroid Heart Disease: Report of Case. J. W. Brittingham, Augusta.—p. 362.
Hookworm Disease as Focus of Infection. S. P. Sanford, Savannah. —p. 365.
Preservation of Learning Ability After Total Removal of Cerebral Cortex. F. A. Mettler, Augusta.—p. 371.

Hypothyroid Heart Disease.—Brittingham cites the case of a person with typical clinical, roentgenographic and electrocardiographic manifestations of "myxedematous heart disease", who became normal under thyroid therapy. The characteristic manifestations of this condition are described and attention is called to the dangers of too rapid or uncontrolled thyroid

administration. The author believes that this type of cardiac abnormality is more common than is supposed and that cardiograms taken of all hypothyroid individuals will add many more cases to those already reported. He has seen the condition in three patients in the last five years.

Iowa State Medical Society Journal, Des Moines

25: 573-634 (Nov.) 1935

Injuries of the Eye. H. S. Gradle, Chicago.—p. 573.
The Business Side of the Practice of Ophthalmology and Otolaryngology. S. B. Chase, Fort Dodge.—p. 576.
Management of Hemorrhage in Ophthalmology and Otolaryngology. W. J. Foster, Cedar Rapids.—p. 577.
Precautions Against Malpractice. W. J. O'Brien, Des Moines.—p. 583.
Survey of Cesarean Sections in Iowa for Years 1930, 1931 and 1932: Preliminary Report. E. D. Plass, Iowa City.—p. 586.
Ambulant Treatment of Hernia. A. F. Bratrud, Minneapolis.—p. 591.
Amebiasis. J. S. McQuiston, Cedar Rapids.—p. 597.
Farm Accidents. R. D. Bernard, Clarion.—p. 601.
Automobile Accidents. E. H. Files, Cedar Rapids.—p. 606.
Industrial Accidents. H. A. Spilman, Ottumwa.—p. 608.

Johns Hopkins Hospital Bulletin, Baltimore

57: 183-246 (Oct.) 1935

Essential Hypertension in Boy of Two Years of Age. Helen B. Taussig and D. B. Remsen, Baltimore.—p. 183.
Observations on Reproduction in Chimpanzee. A. H. Schultz and F. F. Snyder, Baltimore.—p. 193.
Syphilitic Aortitis in Childhood and Youth: Report of Two Cases with Sudden Death. R. F. Norris, Baltimore.—p. 206.
*Subacute Streptococcus Viridans Septicemia: Cured by Excision of an Arteriovenous Aneurysm of External Iliac Artery and Vein. L. Hamman and W. F. Rienhoff Jr., Baltimore.—p. 219.
Rupture of Papillary Muscle in Heart as Cause of Sudden Death. R. R. Stevenson and W. J. Turner, Baltimore.—p. 235.

Subacute Streptococcus Viridans Septicemia.—Hamman and Rienhoff discuss the examination and diagnosis of a young man who had been febrile for six months. The observations demonstrated that the patient was ill with Streptococcus viridans septicemia, but it was not clear where the infection was located. The long duration of the illness, the persisting fever, the anemia, the enlargement of the spleen and the repeatedly positive blood cultures demonstrated that there must be a locus of infection having direct access to the blood stream and continuously discharging bacteria into it. The anticipated evidence of a valvular defect was completely wanting. The heart sounds were clear and of normal quality, except that there was a systolic murmur at the pulmonary urea. Being convinced by repeated examinations that the infection was not located on the heart valves, the authors considered two possibilities: that the vegetations were on the endocardial surface of the chambers of the heart or that they were situated within the arteriovenous aneurysm. Investigation led the authors to believe that in all probability Streptococcus viridans had settled and grown within the arteriovenous aneurysm and from this site of advantage was continuously pouring bacteria directly into the blood stream. Should this be the case, the septicemia might be cured and the patient restored to health by excision of the aneurysm. The specimen removed at operation measured 8.5 cm. in length and consisted of a portion of the external iliac artery and vein, a portion of the common iliac vein and surrounding connective tissue and fat. After the wound had been dressed it was apparent that the circulation in the right leg was defective, for the skin was cold and mottled by areas of cyanosis. During the operation the leg had been elevated above the level of the heart. The patient was adjusted in the recovery bed so that the leg was held level with the heart and was surrounded with hot water bottles. At the end of an hour the circulation had improved greatly and the temperature of the skin had risen to a point a little above normal. The skin was then a bright pink and the areas of cyanosis had disappeared. As vascular tone returned, the color of the skin became normal and the edema disappeared. From then on the patient's recovery was uneventful. Four months after operation the patient had gained 40 pounds (18 Kg.), had an excellent color and was a picture of robust health. He had been working steadily for a month, at first for half a day, but during the previous week for seven hours. He walked about without any support and complained only of a little pain in the leg if he walked too far. At the end of the day there was a little swelling about the ankle which disappeared during the night. The pulse rate was 76. The right leg was normal in appearance. The right thigh and calf measured 1 cm. more than the left. No pulsation could be felt in the right femoral artery or in any other arteries of the leg.

Journal of Bacteriology, Baltimore

30: 335-446 (Oct.) 1935

Precision Photometer for Study of Suspensions of Bacteria and Other Micro-Organisms. H. Mestre, Stanford University, Calif.—p. 335.
Microbial Content of Soft Wheat Flour. D. F. Holtman, Columbus, Ohio.—p. 359.
Microbiology of Upper Air: II. B. E. Proctor, Cambridge, Mass.—p. 363.
Investigation of Sterility of Fish Tissues. B. E. Proctor and J. T. R. Nickerson, Cambridge, Mass.—p. 377.
Some Chemical Changes Exhibited in Sterile and in Contaminated Haddock Muscle Stored at Different Temperatures. J. T. R. Nickerson and B. E. Proctor, Cambridge, Mass.—p. 383.
*Method for Estimating Bacterial Content of Mouth by Direct Count. Mary C. Crowley and U. G. Rickert, Ann Arbor, Mich.—p. 395.
Denaturation of Staphylococcic Proteins. A. P. Krueger and V. C. Nichols, Berkeley, Calif.—p. 401.
Ultrafiltration Experiments with Viruses of Laryngotracheitis and Coryza of Chickens. C. S. Gibbs, Amherst, Mass.—p. 411.
Studies on Effect of Synthetic Surface Active Materials on Bacterial Growth: I. Effect of Sodium Disecondary Butyl Naphthalene Sulfonate on Growth of Mycobacterium Smegmatis. J. Katz and A. Lipsitz, Detroit.—p. 419.
Simple Apparatus for Pouring an Exact Quantity of Agar into Plates Aseptically and Free from Foam and Bubbles. E. Leifson, Baltimore.—p. 423.
Metabolic Activity of Various Colon Group Organisms at Different Phases of Culture Cycle. Grace Mooney and C.-E. A. Winslow, New Haven, Conn.—p. 427.

Estimation of Bacterial Content of Mouth.—With the aim of separating the clumps of bacteria, due to mucin and epithelial cells in the saliva and to the thread forms which entangle masses of bacteria, Crowley and Rickert employed a method similar to that used by Breed and Brew (1933) for making direct bacterial counts of milk, with the exception that an atomizer was used to break up the larger masses and a very dilute sodium hydroxide solution was used as a diluent to dissolve the mucin. They found that the difference in counts made by this method is 13 per cent. The number of bacteria in sprayed washings increased appreciably (at least 36 per cent) over the unsprayed material. Four hundred normal sodium hydroxide treated washings gave a better distribution of bacteria in a smear without, however, materially increasing the count. Counts taken at different times of the day and on different days varied greatly in the same individual. No correlation was noted between counts made by the method described and the "diurnal tide" of Feirer and Leonard.

Journal of Biological Chemistry, Baltimore

111: 285-566 (Oct.) 1935. Partial Index

*New Method for Determination of Minute Amounts of Lead in Urine. J. R. Ross and C. C. Lucas, Toronto.—p. 285.
d-Xylomethylose and Derivatives. P. A. Levene and J. Compton, New York.—p. 325.
Some Effects of Dinitrocresol on Oxidation and Fermentation. M. E. Krahl and G. H. A. Clowes, Indianapolis.—p. 355.
Liver Arginase in Myasthenia Gravis: Contribution to Question of Origin of Creatine. A. T. Milhorat, New York.—p. 379.
Synthesis of Homocystine. W. I. Patterson and V. du Vigneaud, Washington, D. C.—p. 393.
Absorption of Carbon Monoxide with Reduced Hematin and Pyridine Hemochromogen. L. E. Clifcorn, V. W. Meloche and C. A. Elvehjem, Madison, Wis.—p. 399.
Method for Direct and Quantitative Study of Amyloclastic Activity of Amylases. M. L. Caldwell and F. C. Hildebrand, New York.—p. 411.
*Improvements in Methods for Calcium Determination in Biologic Material. C. C. Wang, Cincinnati.—p. 443.
The Ergot Alkaloids: VI. Lysergic Acid. W. A. Jacobs and L. C. Craig, New York.—p. 455.
Cholesterol Esterase in Blood. W. M. Sperry, New York.—p. 467.
Application of Microquinhydrone Electrode to Determination of Hydrogen Ion Concentration of Aqueous Humor of Rachitic and Normal Rats. J. A. Pierce, Baltimore.—p. 501.
Determination of Tissue Carbohydrates. N. R. Blatherwick, Phoebe J. Bradshaw, Mary E. Ewing, H. W. Larson and Susan D. Sawyer, New York.—p. 537.
Hemicellulose from Oat Hulls. E. Anderson and P. W. Krznarich, Tucson, Ariz.—p. 549.
Inactivation of Insulin: Effects of Certain Metal Derivatives and of Sulfydryl Compounds. Ellen D. Schock, H. Jensen and L. Hellerman, Baltimore.—p. 553.

New Method for Determination of Minute Amounts of Lead in Urine.—Ross and Lucas report a microcolorimetric method for the determination of small amounts of lead in urine.

The method is applicable for use in a clinical laboratory, since the time required for a determination is reduced to three hours. The procedure may be readily applied to the urine of young children when only small samples are available.

Calcium Determination in Biologic Material.—Wang states that a new washing solution for calcium oxalate precipitation of 2 per cent ammonia in equal parts of alcohol, ether and water prevents flotation and permits washing of the precipitate without appreciable loss of calcium. The treatment of urine with trichloroacetic acid and carbon allows direct calcium determination on urine.

Journal of Bone and Joint Surgery, Boston

17: 827-1122 (Oct.) 1935. Partial Index

Osteogenic Sarcoma. W. C. Campbell, Memphis, Tenn.—p. 827.
*Mycosis of Vertebral Column: Review of Literature. M. Meyer and M. B. Gall, Strasbourg, France.—p. 857.
*Regrowth of Bone at Proximal End of Radius Following Resection in This Region. C. J. Sutro, New York.—p. 867.
Some Considerations Based on Three Hundred Cases of Arthritis Critically Treated. R. Pemberton, Philadelphia.—p. 879.
Obtaining Union in Ununited Fractures of Humerus. P. B. Magnuson and J. K. Stack, Chicago.—p. 887.
Gas Gangrene and Gas Infections. R. K. Ghormley, Rochester, Minn. —p. 907.
Further Observations on Fractured Distal Radial Epiphysis. A. P. Aitken, Boston.—p. 922.
Fractures of Femoral Neck Treated by Blind Nailing. J. W. O'Meara, Worcester, Mass.—p. 928.
*Recovery of Function in the Hand in Chronic Arthritis. J. G. Kuhns, Boston.—p. 939.
Shelf Stabilization of Hip: Report of Fifty-Three Cases, with Particular Emphasis on Congenital Dislocation. M. B. Howorth, New York. —p. 945.
Bunions. L. L. Stanley and L. W. Breck, San Quentin, Calif.—p. 961.
Fractures of the Carpus. K. Speed, Chicago.—p. 965.
Results Following Tenosuspension Operations for Habitual Dislocation of Shoulder. M. S. Henderson, Rochester, Minn.—p. 978.
Operative Correction of Genu Recurvatum. A. L. Brett, Boston.—p. 984.
Use of Kirschner Wire in Maintaining Reduction of Fracture Dislocations of Ankle Joint: Report of Two Cases. J. Dieterle, Milwaukee.—p. 990.
The Hobart Operation: New Combination Operation for Recurrent Dislocation of Shoulder. M. H. Hobart, Evanston, Ill.—p. 1001.
Operation for Correction of Deformities of Wrist Following Fracture. D. C. Durman, Saginaw, Mich.—p. 1014.
Vascular Massage: Its Technic and Use. H. Jordan, New York. —p. 1021.
Operative Procedure for Correction of External Rotation Contracture of Hip. M. S. Burman, New York.—p. 1028.
*Neglected Factor in Etiology of Gout. J. Krafka Jr., Augusta, Ga. —p. 1049.
Giant Cell Tumor of Sacrum. M. H. Rogers, Boston.—p. 1052.
Congenital Absence of Trapezius and Rhomboideus Major Muscles. B. R. Selden, Bethlehem, Pa.—1058.
Congenital Absence of Sacrum. P. M. Girard, Dallas, Texas.—p. 1062.
Treatment of Depressed Fractures of Zygomatic (Malar) Bone and Zygomatic Arch. R. F. Patterson, Knoxville, Tenn.—p. 1069.

Mycosis of Vertebral Column.—Meyer and Gall review the reports of forty-seven cases of actinomycosis, twelve cases of blastomycosis and one case of sporotrichosis of the vertebral column. The infection of the vertebrae is most often found to be secondary, with a primary focus of infection situated principally in the respiratory and digestive tracts. The vertebrae are infected either by direct contact with a suppurating focus, in which case the external surfaces of the vertebrae are eroded, or by vascular metastasis, in which the bone destruction is found to be central and surrounded by a condensed ring of bone. The first possibility appears to be most frequently the case in actinomycosis, the second in blastomycosis. The differential diagnosis of mycosis of the vertebrae and Pott's disease, for which the former is usually mistaken, is to be made chiefly on the following grounds: 1. The angular deformity is most often absent in mycosis. 2. Mycosis shows multiple sinuses, more destructive invasion and a more rapid opening of abscesses than in Pott's disease; the skin lesions in mycosis are characteristic. 3. Roentgen examination shows erosion of the cortical portion of the vertebra, erosion that is present on the articular processes and pedicles as well as on the vertebral body, or cavity formation in the cancellous portion, surrounded by a zone of increased density. None of these signs are ordinarily seen in tuberculous spondylitis. The bony rarefaction of the latter disease sometimes gives place to a dense appearance in mycosis. One of the factors in the high mortality rate of mycosis of the vertebral column appears to be the difficulty in making an early clinical diagnosis.

Regrowth of Bone at Proximal End of Radius Following Resection.—Surgical resection of a fractured or dislocated proximal portion of the radius may be complicated by the regeneration of a "new head of the radius," as Sutro noted in the four cases that he reports. This eventuates most probably from the accumulation and organization of blood in the space left by the surgical resection of the head of the radius, with or without excision of the neck. The marrow spaces of the long tubular bones contain tissue with osteogenic potentialities, and it apparently makes its way into the adjoining organized hemorrhage. Furthermore, the periosteum of the radius adjacent to the resected area, as well as the tissue of the joint capsule, apparently participates in the formation of this bone. Most of the newly formed trabeculae, which result in an increase in the length and width of the proximal end of the radius, are formed by osteoblastic activity as well as by metaplasia of the contiguous fibrous tissues. Some of the recently formed fibrous bone is soon transformed into adult bone. The "new head of the radius" may present a cortex and a medullary canal. However, it lacks hyaline articular cartilage. The proximal surface of the "new radial head" may be capped either by fibrocartilage or by fibrous tissue. This is most probably derived from the capsular tissue about the joint. The formation of bone at the site of the resection of the original head of the radius may lead to an unusual lengthening of the shaft of the radius when compared with the normal opposite radius. In cases in which surgical removal of the proximal portion of the radius is necessary, a reconstruction operation should be attempted, fascia lata being used to prevent abnormal growth of the stump. The periosteum on the proximal (free) end of the shaft of the radius should be stripped back; all bone fragments, periosteal strips or capsular tissue, either lying free in the joint or loosely attached to contiguous tissues, should be removed. In addition, if an unusually large segment of the proximal portion of the original radius is resected, the gap should be filled by a bone graft.

Recovery of Function of Hand in Arthritis.—Kuhns states that improvement in the function of the hand crippled by arthritis is possible, no matter how severe the disability. Prevention of deformity in chronic arthritis is much easier and gives a better end result than correction of deformity after the arthritis becomes quiescent. Deformity can be prevented by careful supervision and frequent splinting. The treatment for rehabilitation of the hand can be divided into three stages. The first, when deformity can be corrected passively; splints, exercises and heat will usually correct the deformity. The measures are carried out simultaneously with the treatment of the patient for the chronic arthritis. In the second stage, when deformity cannot be corrected passively and definite bony ankylosis is not present, more active measures, such as manipulations and constant traction, should be added. The third stage of operative correction of deformity should be undertaken only in cases of quiescent arthritis. Surgical procedures should be performed on the hand only after an appraisal of the functional status of the whole arm and with due regard to the functional need of the individual patient.

Neglected Factor in Etiology of Gout.—Krafka points out that any condition which tends to stimulate the erythropoietic system becomes an important factor in the overproduction of uric acid and thus a potential etiologic agent in gout. He presents two cases, the results of which are thoroughly in accord with his hypothesis and follow in logical sequence—marrow stimulation, overproduction of uric acid, gout. Another phenomenon, which has heretofore been obscure, is the association of the "gouty diathesis" with polycythemia. The obscure relationship between gout and lead poisoning loses much of its mystery when it is remembered that lead is a very active hemolytic agent and that every low blood count is compensated by an increased marrow activity. The author states that the spontaneity, the afebrile character and the tendency to become polyarticular all fit in with his hypothesis. Marked uric acid outputs have occurred in experimental animals immediately after hemorrhage or hemolysis, reaching a peak in about three days. He explains the disappearance of the old fashioned gout of a hundred years ago on the basis of the discontinuance of the medical practice of "bleeding," since even small hemor-

rhages are marked hematopoietic stimuli. By directing attention to the principal source of the offending agent, uric acid, a more satisfactory treatment of gout is possible. All hemolytic and hematopoietic agents should be used with discretion. In determining whether or not such agents are indicated, the normal reticulocyte count of 0.5 per cent should be the guiding factor.

Journal of Comparative Neurology, Philadelphia

62: 263-532 (Oct. 15) 1935. Partial Index

Corticifugal Fiber Connections of Cortex of Macaca Mulatta: Parietal Region. F. A. Mettler, Ithaca, N. Y.—p. 263.
Comparative Cyto-Architectonic Study of Motor and Premotor Areas in Primate Cortex. P. C. Bucy, Chicago.—p. 293.
Presence of Sensory Nerve Cells in Central Root of Trigeminal Nerve. G. A. Peters, Bloomington, Ind.—p. 349.
Comparative Volumetric Study of Gray and White Substance of Spinal Cord. A. M. Lassek, Chicago.—p. 361.
Mitosis in Neural Tube. F. C. Sauer, Wichita, Kan.—p. 377.
Retrograde Cell Degeneration in Thalamus of Macacus Rhesus Following Hemidecortication. A. E. Walker, Chicago.—p. 407.
Extent and Structure of Electrically Excitable Cerebral Cortex in Frontal Lobe of Dog. W. K. Smith, Rochester, N. Y.—p. 421.
Posterior Column Fibers and Their Termination in Macacus Rhesus. A. Ferraro and S. E. Barrera, New York.—p. 507.

Journal of Experimental Medicine, New York

62: 457-620 (Oct. 1) 1935

Hemoglobin Regeneration in Chronic Hemorrhagic Anemia of Dogs (Whipple): I. Effect of Iron and Protein Feeding. C. C. Sturgis and G. E. Farrar Jr., Ann Arbor, Mich.—p. 457.
Quantitative Theory of Precipitin Reaction: II. Study of Azoprotein Antibody System. M. Heidelberger and F. E. Kendall, New York.—p. 467.
Lipoids and Immunologic Reactions: I. Relation of Phospholipins to Type Specific Reactions of Antipneumococcus Horse and Rabbit Serums. F. L. Horsfall Jr. and K. Goodner, New York.—p. 485.
*Immunologic Studies with Virus of Influenza. T. Francis Jr. and T. P. Magill, New York.—p. 505.
Inactivation of Poliomyelitis Virus in Vitro by Crystalline Vitamin C (Ascorbic Acid). C. W. Jungeblut, New York.—p. 517.
Progression to Carcinoma of Virus Induced Rabbit Papillomas (Shope). P. Rous and J. W. Beard, New York.—p. 523.
Jennerian Prophylaxis by Means of Intradermal Injections of Culture Vaccine Virus. T. M. Rivers and S. M. Ward, New York.—p. 549.
Infection of Mice with Swine Influenza Virus. R. E. Shope, Princeton, N. J.—p. 561.
Cutaneous Reactivity of Immune and Hypersensitive Rabbits to Intradermal Injections of Homologous Indifferent Streptococcus and Its Fractions. C. McEwen and H. F. Swift, New York.—p. 573.
Distribution of Blood Group Properties and Blood Group Property Destroying Factors in Intestinal Tract of Man. E. Witebsky and E. Neter, New York.—p. 589.
*Bile Fistulas and Related Abnormalities: Bleeding, Osteoporosis, Cholelithiasis and Duodenal Ulcers. W. B. Hawkins and G. H. Whipple, Rochester, N. Y.—p. 599.

62: 621-732 (Nov. 1) 1935

Phenomenon of Local Skin Reactivity to Bacterial Filtrates: Elicitation of Local Reactivity by Way of Vascular System. G. Shwartzman, New York.—p. 621.
Colony Morphology of Tubercle Bacilli: III. Relation Between Virulence and Colony Form. K. C. Smithburn, New York.—p. 645.
Comparative Behavior of Mammalian Eggs in Vivo and in Vitro: I. Activation of Ovarian Eggs. G. Pincus and E. V. Enzmann, Cambridge, Mass.—p. 665.
Epidemiology of Equine Encephalomyelitis in the Eastern United States. C. TenBroeck, E. W. Hurst and E. Traub, Princeton, N. J.—p. 677.
Transmission of Equine Encephalomyelitis Virus by Aedes Aegypti. M. H. Merrill and C. TenBroeck, Princeton, N. J.—p. 687.
Quantitative Theory of Precipitin Reaction: III. Reaction Between Crystalline Egg Albumin and Its Homologous Antibody. M. Heidelberger and F. E. Kendall, New York.—p. 697.
Further Observations on Blood Cholesterol of Rabbits in Relation to Atherosclerosis. K. B. Turner and Emily H. Bidwell, New York.—p. 721.

Immunologic Studies with Virus of Influenza.—According to Francis and Magill, following infection with the virus of influenza, both ferrets and mice develop a state of active immunity to reinfection. The serum of these animals contains neutralizing antibodies, as evidenced by the capacity of the serum to confer passive protection to mice against infection with the Puerto Rico 8 and Philadelphia strains of the virus of human influenza. Rabbits apparently insusceptible to infection with the virus of influenza produce specific antibodies in response to repeated injection of virus-containing material. The serum of immunized rabbits affords passive protection to mice against mouse-virulent virus. Although the subcutaneous or intraperitoneal injection of the living virus does not produce infection in mice, animals so treated acquire active immunity against subsequent infection by the intranasal route. Neutralization tests with the serum of patients before and after recovery from influenza, pneumonia and the common cold indicate that neutralizing antibodies arise as a specific response to infection with the virus of influenza. The immunologic identity of strains of influenza virus recovered from human sources has been established, and the possible existence of strains of related, but not identical, antigenic structure is discussed.

Bile Fistulas and Related Abnormalities.—Hawkins and Whipple state that it is not easy to keep a bile fistula dog in a normal state for months if proper attention is given to the diet and physical condition. The most significant abnormalities are intestinal disturbances, spontaneous bleeding, osteoporosis, cholelithiasis and duodenal ulcer. They used three types of bile fistula in their experiments, and each one has its advantages and disadvantages. Intestinal intoxication is best controlled by diet, whole bile or bile salts or combinations of dog and ox bile. Spontaneous bleeding seems to be due to the loss of something by way of the bile, and this can be prevented by bile feeding. The blood deficiency appears to be a lack of prothrombin. Osteoporosis appears inevitably after many months if bile is excluded from the intestine. This state is related to the lack of absorption of vitamin D. It is of some interest that liver feeding will prevent it. Duodenal ulcers and cholelithiasis are common in bile fistula dogs and absolute control or prevention is not easy. Bile secretion into the intestine is necessary for normal health and even for actual continuation of life beyond a period of a few months. The authors believe that some of these experimental data should be of value to physicians and surgeons in the care and study of human fistula cases and should emphasize the necessity of prompt dietary control.

Journal of Immunology, Baltimore

29: 267-342 (Oct.) 1935

Relation of Heterophile Antigen to Serum Sickness. H. M. Powell, W. A. Jamieson and G. F. Kempf, Indianapolis.—p. 267.
Chemical Study of Pollen Sensitizing Antibody Combination. F. M. Stevens, New York.—p. 273.
Hemorrhagic Reaction at Site of Injection of Toxins After Intravenous Injection of Starch in Young and Adult Rabbits. J. Freund and Elizabeth Page Hosmer, New York.—p. 279.
*Cutaneous Reactions and Antibody Response to Intracutaneous Injections of Pneumococcus Polysaccharides. M. Finland and H. F. Dowling, Boston.—p. 285.
Studies of Anaphylaxis in Albino Rat, with Reference to Diet and Histamine. H. N. Pratt, Boston.—p. 301.
Immunologic Study in Laboratory Animals of Thirteen Different Strains of Equine Encephalomyelitic Virus. Beatrice F. Howitt, San Francisco.—p. 319.

Response to Intracutaneous Injections of Pneumococcus Polysaccharides.—Finland and Dowling elicited immediate cutaneous reactions, similar to those described by Tillett and Francis, in patients recovering from pneumonia. These reactions were, in general, type specific and were associated with the homologous type antibody in the serum. Very similar reactions were elicited with preparations of soluble specific substances and cellular carbohydrates prepared from the same pneumococcus types by the methods of Heidelberger, Goebel and Avery and those of Wadsworth and Brown. Characteristic delayed reactions were seen only with the cellular carbohydrates. These were not associated with type specific antibodies. They were most frequently observed with the cellular carbohydrates of the atypical type I pneumococcus and with that obtained from the virulent type I strain. Delayed cutaneous reactions with the cellular carbohydrate of an atypical type I pneumococcus were obtained regularly during the febrile stage of a variety of infectious disease and could not be elicited soon after recovery in such cases. These observations are similar to those obtained by Francis and Abernethy with the C substance of Tillett, Goebel and Avery. All the type specific polysaccharides were antigenically active in human subjects. They produced in almost every instance a strictly specific antibody response. Only minor differences were observed with the different preparations of types II and III polysaccharides. The type I cellular carbohydrate, however, was quantitatively more active than the corresponding SSS in this respect. Occasional subjects showed specific antibodies, particularly against type I pneumococci, following injections of the atypical cellular carbohydrate.

Journal of Lab. and Clinical Medicine, St. Louis

21: 1-110 (Oct.) 1935

Influence of Dextrose Ingestion on Amino Acid Nitrogen, Urea Nitrogen and Hemoglobin Concentration of Blood. E. G. Schmidt and J. S. Eastland, Baltimore.—p. 1.

*Comparative Study of Glucose and Sucrose Tolerance Tests. E. G. Schmidt, J. S. Eastland and J. H. Burns, Baltimore.—p. 13.

Bactericidal and Photochemical Properties of Irradiated Petrolatum and Mineral Oil. F. A. Stevens, New York.—p. 26.

Bactericidal Action of Short and Ultrashort Waves. C. K. Gale and D. Miller, New York.—p. 31.

The Doctor as Author. E. Podolsky, Brooklyn.—p. 32.

*Blood Sedimentation Rate in Diabetes Mellitus: Analytic Study of Five Hundred and Ten Tests Performed on Three Hundred and Sixty-Six Patients. D. W. Kramer, Philadelphia.—p. 37.

Subclinical Scurvy in Children: Application of Capillary Resistance Test. M. Molitch, Jamesburg, N. J., with technical assistance of R. F. Cousins.—p. 43.

Experimental Arthritis in Rabbits: Comparison of Arthritis Producing Ability of Inagglutinable Streptococci Which Resist "Bactericidal" Action of Fresh, Diluted, Defibrinated Guinea-Pig Blood and Those Which Are Agglutinable But Sensitive to the "Bactericidal" Agent. W. B. Rawls and G. H. Chapman, New York.—p. 49.

Effect of Hydrogen Ion Concentration on Determination of Calcium in Blood Serum Phosphomolybdic Acid Centrifugates. J. H. Defandorf, Washington, D. C.—p. 65.

Technic of Molding and Casting for Medical Sciences. C. D. Clarke, Baltimore.—p. 68.

*Improved Congo Red Test for Amyloidosis. M. M. Friedman and O. Auerbach, Staten Island, N. Y.—p. 93.

Improved Procedures for Estimating Bismuth in Body Fluids and Tissues. A. J. Lehman, A. P. Richardson and P. J. Hanzlik, San Francisco.—p. 95.

Study of Dextrose and Sucrose Tolerance Tests.—Schmidt and his co-workers made a comparative study of the blood sugar curves and sugar excretion, if any, on a series of fifty-seven hospital patients after the ingestion of dextrose, followed a few days later by an equal quantity of sucrose, or vice versa. With one exception these patients were admitted for conditions other than diabetes and only through tolerance studies were the diabetic tendencies discovered. A group of eighteen patients, free from obvious carbohydrate metabolism abnormalities, gave normal blood sugar curves and urines negative to Benedict's solution with both sugars. The average blood sugar curve given by the sucrose meal was 11.51, 12.71 and 2.75 per cent lower than that given by dextrose for the one-hour, two-hour and three-hour periods. Therefore the ingestion of approximately 100 Gm. of sucrose ordinarily yields a blood sugar curve well within the normal limits as established by dextrose tolerance tests. The urines were free from sucrose or reducing sugars, regardless of the type of sugar ingested. Twelve patients with diabetes mellitus showed marked hyperglycemia and glycosuria with both sugars. The average blood sugar values for these sucrose tolerance tests were 118, 225.3, 184 and 149.6 mg. per hundred cubic centimeters for the fasting, one-hour, two-hour and three-hour periods, as compared to 117.8, 247.8, 222.6 and 185 mg. for dextrose at the respective time intervals. Both sugars resulted in glycosuria to approximately the same extent. In no case did the administration of sucrose fail to bring out the diabetic tendencies of these patients. Clinically, sucrose is as satisfactory as dextrose for the detection and evaluation of diabetes mellitus. Twenty-seven patients with various arthritic and infectious conditions have also been studied in a like manner. The average blood sugar values following sucrose ingestion were 103.9, 183.4, 160.4 and 123.7 mg. per hundred cubic centimeters for the fasting, one-hour, two-hour and three-hour periods, as compared to 103.7, 198.3, 173.8 and 136.9 mg. for dextrose at similar time intervals. Sucrose tolerance tests as well as dextrose tolerance tests show that an abnormality in carbohydrate metabolism is present during arthritis, infections and similar conditions. In addition, sucrose ingestion shows equally well that this abnormality disappears as the infection clears up. Despite the high values for the blood sugars, the urines were usually free from reducing sugars. Glycosuria was present during six dextrose tolerance tests and during two sucrose tolerance tests.

Blood Sedimentation Rate in Diabetes Mellitus.—Kramer performed 510 tests on 366 office and outpatient patients. The technic employed in the study was the one advocated by Cutler. Abnormal readings were obtained in 346 (67.8 per cent) of the 510 sedimentation tests. The explanation for this high percentage must be either the diabetes or the presence of infections, or both. A study of the duration of the diabetes showed that the maximal difference of the percentages in the various diabetic groups was only 5.3 per cent. These figures evidently do not permit one to attach much significance to the effect of the duration of the diabetes on the sedimentation rate. Also the possible influence of the blood sugar was studied. There was a striking similarity of the percentages in the hyperglycemic group and those whose blood sugar was 180 mg. or below: in the former there were 194 cases (67.1 per cent) which showed abnormal lines, and in the latter (nonhyperglycemic group) there were 152 records (68.8 per cent) with abnormal lines. The blood sugar by itself had no influence on the sedimentation rate. Since the duration of the diabetes and the blood sugar cannot explain the high incidence of the abnormal sedimentation rates, the inference is that the most likely explanation is infection. Analysis of the patients showed a high incidence of the minor infections, particularly in the teeth, tonsils and upper respiratory tract. However, the urinary tract and gallbladder must also be kept in mind.

Improved Congo Red Test for Amyloidosis.—Friedman and Auerbach state that the disadvantages of the congo red test for amyloidosis can be overcome by the use of ethyl alcohol, which precipitates the proteins and dissolves the congo red, giving a clear solution that can be read with the colorimeter. The test is carried out on the patient in a postabsorptive state. Ten cc. of a 1 per cent congo red solution is injected into a vein and four minutes later about 10 cc. of blood is withdrawn from another vein. The second sample of blood is taken one hour after injection. It is advisable for the tubes to stand about two hours, permitting the clots to retract. The tubes are next centrifugated at a moderate speed (3,000 revolutions per minute) for ten minutes and the serum is decanted carefully. Two cc. of serum is pipetted into 15 cc. graduated conical test tubes and made up to 10 cc. with 95 per cent ethyl alcohol. The tubes are corked, shaken for thirty seconds and centrifugated at a high speed for ten minutes. The clear supernatant fluids are poured into colorimeter cups and readings are made on the colorimeter. The readings are best when the four-minute specimen is set at 20 mm. The calculation is 100 minus the factor of a four-minute reading divided by a one-hour reading multiplied by 100 equals per cent absorption. The solution remains unchanged indefinitely when corked. Lipoidal serum gives a very clear supernatant alcoholic solution.

Journal of Pharmacology & Exper. Therap., Baltimore

55: 127-234 (Oct.) 1935

Studies of Morphine, Codeine and Their Derivatives: IX. Methyl Ethers of Morphine and Codeine Series. N. B. Eddy, Ann Arbor, Mich.—p. 127.

Purification of Pressor and Oxytocic Hormones of Pituitary Gland and Some Observations on Chemistry of Products. R. L. Stehle and A. M. Fraser, Montreal.—p. 136.

Some Unsymmetrical Alkylaryl Ureas Preparations, Physical Properties and Hypnotic Effects. A. M. Hjort, E. J. deBeer, J. S. Buck and W. S. Ide, Tuckahoe, N. Y.—p. 152.

Effect of Temperature on Calorigenic Action of Dinitrophenol in Normal and Thyroidectomized Pigeons. O. Riddle and Guinevere C. Smith, Cold Spring Harbor, N. Y.—p. 173.

Mechanism of Chemotherapeutic Action: XII. Comparison of Binding of Chemotherapeutic Agents by Normal and Resistant Trypanosomes. J. T. Pedlow and L. Reiner, Tuckahoe, N. Y.—p. 179.

Antipyretic and Toxic Effects of Combinations of Acetanilid with Sodium Bromide and with Caffeine. P. K. Smith and W. E. Hambourger, New Haven, Conn.—p. 200.

Effect of Zinc Salts on Action of Insulin. D. A. Scott and A. M. Fisher, Toronto.—p. 206.

Acetanilid Studies. B. Fantus, H. A. Dyniewicz and J. M. Dyniewicz, Chicago.—p. 222.

Kentucky Medical Journal, Bowling Green

33: 439-482 (Oct.) 1935

Primary Adenocarcinoma of Kidney. L. Atherton, Louisville.—p. 440.

Deadly Trend of Goiter and Its Cure. W. D. Haggard, Nashville, Tenn.—p. 444.

Chondroma of Os Calcis and Fibula. M. Thompson, Louisville.—p. 448.

The Heart. E. C. McGehee, Ashland.—p. 451.

Preview of Economic Security in Kentucky. V. E. Simpson, Louisville.—p. 453.

Use of Corbus-Ferry Filtrate in Treatment of Gonorrheal Urethritis. J. M. Townsend, Louisville.—p. 463.

Brain Abscess Complicating Acute Otitis Media: Case Report. J. R. Peabody, Louisville.—p. 465.

Treatment of Hirschsprung's Disease. F. W. Rankin, Lexington.—p. 474.

Laryngoscope, St. Louis

45: 741-826 (Oct.) 1935

Treatment of Otosclerotic and Similar Types of Deafness by Local Application of Thyroxine. A. A. Gray, London, England.—p. 741.
Clinical Symposium: I. Two Cases of Early Carcinoma of Larynx, and a Number of Cases of So-Called Adenoma of the Bronchi, Apparently Cured by Diathermy. J. D. Kernan, New York.—p. 760.
Id.: II. Series of Cases of Total Laryngectomy for Cancer. R. E. Buckley, New York.—p. 769.
Id.: III. Series of Cases of Radical Mastoidectomy with Skin Graft. D. S. Cunning, New York.—p. 776.
Id.: IV. Present Status of Radical Sinus Surgery. E. R. Faulkner, New York.—p. 782.
Spontaneous Perforation of Eardrum: Case. P. Panneton, Montreal. —p. 786.
Mortality of Mastoiditis and Cerebral Complications, with Review of Thirty-Two Hundred and Twenty-Five Cases of Mastoiditis with Complications. M. M. Kafka, Brooklyn.—p. 790.

Medical Annals of District of Columbia, Washington

4: 263-288 (Oct.) 1935

The Major Importance of Minor Infections. P. A. Caulfield, Washington.—p. 263.
*Lymphogranuloma Inguinale: Cause of Rectal Stricture. W. B. Marbury, Washington.—p. 268.
Phrenicotomy: Analysis of Results in Thirty-Six Cases. E. Horgan and J. W. Peabody, Washington.—p. 274.
Fundamentals of Internal Medicine: Diseases of the Nervous System. A. Schneider, Washington.—p. 277.

Inguinal Lymphogranuloma.—During the last three years Marbury has seen twelve cases of lymphogranulomatosis showing stricture of the rectum. In all but one case, in which colostomy was performed, the treatment has been digital dilation of the strictured area with the patient under general anesthesia. He feels sure that many more cases of lymphogranuloma have been seen in the outpatient department but have not been recognized or treated. The condition seems to be limited to individuals in the lower walks of life, although he believes that several patients from the middle strata would have given a positive reaction to the specific antigen. Eleven of the twelve patients having rectal stricture were Negro women, the other a white male. Their ages ranged from 18 to 40 years, spanning their active sex life. All the patients complained of "piles." On further inquiry they admitted that they had had a change of intestinal habits beginning from one month to seventeen years previously. The usual history was that there had been a progressively increasing constipation, which required more and more cathartics and resulted in very painful stools. None of the patients admitted having any remembrance of a primary sore, though most of the women said that they had had some vaginal discharge at times. The Wassermann test was negative in seven cases, positive in three and was not made in two. The Frei test was positive in the three cases in which it was performed. The constricted area gave much more readily to dilation than it does in cases of carcinoma or of stricture due to scar tissue. When the area was sufficiently dilated, a large, well lubricated rectal whistle, 5 inches long and 1½ inches wide, was inserted and left in for two days. During this time the patient was given a generous allowance of morphine. When the whistle was removed, retention enemas of warm water and hamamelis were given twice daily. The patients have usually remained in the hospital less than a week, and on discharge they have been instructed to keep up the enemas and to return to the dispensary for treatments. Dilation with bougies is carried out once or twice a month or as long as the patient continues to come to the dispensary.

Minnesota Medicine, St. Paul

18: 695-760 (Nov.) 1935

Prevention of Whooping Cough with Bacillus Pertussis Vaccine. L. Sauer, Chicago.—p. 695.
Inception and Development of Fluoroscopy: The Influence of Carman on Its Status in America. P. Brown, Boston.—p. 699.
Prognosis and Treatment of Coronary Occlusion. W. S. Middleton, Madison, Wis.—p. 710.
Correlation of X-Ray Heart Shadows with Clinical and Autopsy Findings. A. Hoff, St. Paul.—p. 724.
Verruca Senilis and Keratoma Senile. H. Montgomery, Rochester. —p. 735.
Essential Hypertension and Tuberculosis. C. G. Morlock, Rochester. —p. 738.
Herpes Zoster Ophthalmicus. P. D. Berrisford, St. Paul.—p. 741.
Some Observations on Intranasal Operation for Frontal Sinusitis. C. M. Anderson, Rochester.—p. 744.

New England Journal of Medicine, Boston

213: 741-786 (Oct. 17) 1935

Use of Dilaudid in Treating Patients with Cancer. I. T. Nathanson and E. M. Daland, Boston.—p. 741.
Muscle Grafts for Hemostasis in General Surgery. H. M. Clute, Boston. —p. 746.
Amebiasis in a Rural Community. F. H. Connell, Hanover, N. H.—p. 748.
Carcinoma of the Breast in New Hampshire: Preliminary Report. J. C. Donchess, Hanover, N. H.—p. 752.
Evolution or Revolution. R. J. Ward, Worcester, Mass.—p. 757.
The Adult Tuberculosis Contact. H. R. Edwards, New York.—p. 760.
Coincidence of Cholecystitis and Peptic Ulcer. E. G. Laird, New York. —p. 764.

213: 787-840 (Oct. 24) 1935

Psychopathy and the General Practitioner. H. K. Richardson, Stockbridge, Mass.—p. 787.
*Diathermy in Lobar Pneumonia: Preliminary Report. W. Wetherbee Jr., J. A. Foley and J. Resnik, Boston.—p. 796.
Specific and Nonspecific Arthritis, with Especial Reference to Trauma. B. H. Archer, New York.—p. 799.
Gonadotropic Hormone (Prolan) in Relation to Carcinoma of Cervix. J. A. Halsted, Boston.—p. 803.
Progress in Hematology: Late 1933 and 1934. W. Dameshek, Boston. —p. 805.

Diathermy in Lobar Pneumonia.—Wetherbee and his co-workers employed the standard treatment for lobar pneumonia, including serum and/or oxygen when indicated, in thirty-six cases. In addition, one half of these patients, alternately chosen, were given physical therapy in the form of diathermy. The mortality for the entire series was 22.2 per cent, for the diathermy group 11.1 per cent, and for the control group 33⅓ per cent. The cases are presented in some detail and the effects of diathermy noted. Lobar pneumonia is a self-limited disease. If during its course rest and relaxation can be obtained, if the patient can be made comfortable, the pain eased, the dyspnea relieved and the apprehension lessened, or if, in other words, the patient can be carried along until such time as the illness has run its course, the most valuable thing will have been done that can be done in any self-limited disease. The authors feel that if the mortality of lobar pneumonia is ever lowered it will be as a result of treatment directed along these lines rather than as a result of any more specific treatment. They do not imply that serum, for instance, has no value. The fact remains, however, that in any large series of cases the mortality is about what it was before serum was used. There is beyond question a growing feeling that specific therapy is not as valuable as it appeared to be at first. Because the mortality in the diathermy group was one-third that of the control group and because of the definite subjective improvement in the patients treated by this method, they feel justified in continuing with this form of treatment until a sufficiently large series of cases, with controls, has been accumulated and more definite conclusions can be drawn.

Northwest Medicine, Seattle

34: 369-412 (Oct.) 1935

Pertinent Suggestions to the Washington Profession. N. L. Thompson, Everett, Wash.—p. 369.
Allergy: Its Recognized Causes. A. H. Rowe, Oakland, Calif.—p. 371.
*Prostatic Hypertrophy: Treated by Acid Nitrate of Silver Solution. M. E. Reitzel, McMinnville, Ore.—p. 374.
Mumps Meningitis and Meningo-Encephalitis: Report of Six Cases. L. H. Smith, Portland, Ore.—p. 375.
Dermatoconjunctivitis Probably Due to Eyelash or Hair Dye: Report of Case. C. A. Veasey Sr., Spokane, Wash.—p. 379.
Hypotension: Growing Appreciation of Its Importance. O. H. P. Pepper, Philadelphia.—p. 380.
Hypophysis and Adjacent Structures: Their Normal and Pathologic Physiology. A. B. Luckhardt, Chicago.—p. 384.
Rectal and Rectosigmoidal Cancer: Surgical Treatment and Prognosis. F. W. Rankin, Lexington, Ky.—p. 387.
Extraperitoneal Cesarean Section. J. F. Scott, Yakima, Wash.—p. 391.
Internal Derangement of Temporomandibular Joint. D. G. Leavitt, Seattle.—p. 393.

Prostatic Hypertrophy.—Reitzel used a 20 per cent solution of silver nitrate with from 1 to 4 per cent nitric acid in cases of prostatic hypertrophy, the acid addition depending on the degree of alkalinity of the urine. The urethra was anesthetized with butyn or metycaine (2 per cent solution) and the bladder was drained through a catheter lubricated with a water soluble jelly. A urethroscope was inserted and the prostatic urethra

dried with a cotton wrapped probe. A tubular metal instrument, slightly curved and fitted with an obturator, was passed into the prostatic urethra and the obturator was withdrawn. From 20 to 25 drops of the acid silver solution was run into the tube and the obturator was reinserted and pushed home. From three to five such treatments were given at intervals of from three to five days. The author has employed the treatment in 103 cases to date. Most of the cases have been followed up and reports are gratifying.

Oklahoma State Medical Assn. Journal, McAlester

28: 357-394 (Oct.) 1935

*Preliminary Observations on Vitamin A Deficiency as Shown by Studies with Visual Photometer. I. O. Park, Muskogee.—p. 357.
Cancer of the Skin. R. L. Sutton Jr., Kansas City, Mo.—p. 364.
Some of the Causes Why Infants Are Removed from the Breast with the Idea that Mothers' Milk Is the Offender. C. V. Rice, Muskogee. —p. 368.
Personal Experiences with Prostatic Resection. H. S. Browne, Tulsa. —p. 371.
Reducing Mortality Rate in Cases of Perforated Appendixes. J. T. Colwick, Durant.—p. 374.

Vitamin A Deficiency as Shown by Visual Photometer.—Park shows the therapeutic value of vitamin A in a number of pathologic states and in seemingly healthy individuals and calls attention to the use of the photometer, according to the technic of Jeans and Zentmire, as a simple method to be used by the general practitioner for the detection of vitamin A deficiency and for measuring response to vitamin A therapy. The author has tested more than 275 individuals, including normal cases, gastro-intestinal disorders, sinus and miscellaneous infections, nervous and mental conditions, kidney disorders, pernicious anemia, leukemia, diabetes and marked night blindness. Carotene or provitamin A rapidly restores the vitamin A content in cases in which its activity is not hindered by disease or complications that serve to prevent its absorption and conversion. No bad effects have been noted from the use of carotene in oil in large doses. From the tests made covering people in every walk of life, it appears that a large proportion of our population is low in vitamin A. There is no definite proof that vitamin A is anti-infectious, but all results point to its action as a barrier against infection by stimulating healthy epithelial tissue. The author states that examinations of specimens of liver from 300 necropsies (Moore) for vitamin A showed about the same results as found by the photometer in his series, the different pathologic states showing the same proportionate deficiency as found by the photometer.

Pennsylvania Medical Journal, Harrisburg

39: 1-60 (Oct.) 1935

The Problem of Appendicitis. C. F. Freed, Reading.—p. 5.
*Hyperthyroidism and Heart Disease: Case Report. T. J. Ryan, Philadelphia.—p. 10.
*Hypoglycemia as Cause of Mental Symptoms: Report of Cases. J. Greenwood Jr., Houston, Texas.—p. 12.
The Well Fitted Brassiere and Its Use. P. S. Seabold, Lebanon.—p. 16.
Rattlesnake Bite: Case Report. W. M. Cashman, Warren.—p. 19.
Benzylmethyl Carbinamine (Benzedrine): Study of Rapidity and Duration of Its Shrinking Action in Nasal Turbinates. A. A. S. Giordano, Philadelphia.—p. 20.
Treatment of Diabetic Gangrene. W. A. Steel, Philadelphia.—p. 22.
Analysis of Two Hundred and Fifty-Nine Cases of Syphilis Complicating Pregnancy. M. A. Castallo and A. E. Rakoff, Philadelphia.—p. 24.
The Common Sense of Maternal Mortality. O. J. Toland, Philadelphia. —p. 29.

Hyperthyroidism and Heart Disease.—Ryan states that the presence of hyperthyroidism may easily be overlooked as the basic cause of cardiac symptoms. When the patient applies for treatment, the cardiac symptoms may be of such severity that the immediate therapy is directed to the heart. This mistake may be avoided by insisting on a basal metabolic rate determination in all cases of cardiac disease. The hypertension case and the colloid goiter in the young should not be erroneously diagnosed as hyperthyroidism until repeated estimations of the basal metabolic rate have given a true basic reading. Occasionally in the borderline case the Goetsch test will give valuable diagnostic information. The presence of paroxysmal tachycardia or fibrillation should suggest immediately that the thyroid is hyperfunctioning. A case of a large nodular goiter involving the whole left lobe of the thyroid and associated general anasarca involving both lower extremities, the abdomen and both pleural cavities is discussed. The radial pulse was very rapid and irregular. Marked dyspnea and cyanosis were present. Medical therapy was directed to the heart with little success, and operation was deferred because of the poor condition of the patient. It was hoped that, as improvement occurred in the heart, a thyroidectomy might be performed. The improvement in the heart did not occur; the patient developed bronchopneumonia and later an uncontrollable neurosis. Two months after admission it was decided that a thyroidectomy should be attempted, and the left lobe of the thyroid was completely removed under local anesthesia. The right lobe was examined at the time of operation and found normal. Examination one year after operation showed that the patient had gained 70 pounds (31.8 Kg.). Her pulse rate was 90, and the rhythm was normal. The tone was good, and no murmurs could be heard. The heart was completely compensated.

Hypoglycemia as Cause of Mental Symptoms.—Because of definite evidence in the literature that many of the symptoms of hyperinsulinism are mental, Greenwood has looked for these cases in psychopathic wards of the Philadelphia General Hospital. It is significant that there is a somewhat higher percentage of low blood sugar determinations found in psychopathic patients than in patients in the general medical and surgical wards. The diagnostic features are (1) a psychosis, which may take almost any form, often violent in character and belonging to the organic group in that the sensorium is always affected (2) psychotic manifestations, which alternate with periods of normal behavior, a more or less transient psychosis depending on the severity of hypoglycemia; (3) a low blood sugar estimation during the psychotic period; (4) relief from symptoms when dextrose is given; (5) a high dextrose tolerance, as evidenced by a dextrose tolerance curve, which is below normal either during the period of fall or at any point in its course, and (6) a tendency for the psychotic episodes to occur in the early morning, late at night or occasionally just before mealtime. Starvation or irregularity in meals seemed to be a precipitating factor in three of the six cases reported. The omission of a meal might cause a low blood sugar level to descend further to a dangerous point and so initiate the mental symptoms. There is little doubt that hypoglycemia may cause a definite psychosis necessitating institutional care, and it is important for the general practitioner to be able to recognize these cases. The symptoms are so quickly relieved by the oral or intravenous administration of dextrose that confinement in a mental hospital could be avoided, except in a few of the more severe cases.

Puerto Rico J. Pub. Health & Trop. Med., San Juan

11: 1-166 (Sept.) 1935

Evaluation of Ultraviolet Radiation for Use in Medicine. W. W. Coblentz, Washington, D. C.—p. 1.
*Treatment of Anemia Associated with Hookworm Disease: Preliminary Report. R. Rodríguez Molina, San Juan.—p. 49.
Actinomyces and Actinomycosis. C. W. Emmons, San Juan.—p. 63.
Intensive Method of Control Applied to Yaws: Preliminary Report. J. B. Gotay, O. Costa Mandry and G. C. Payne, San Juan.—p. 91.
Spore Form Common to Three Etiologic Agents of Chromoblastomycosis. A. L. Carrión and C. W. Emmons, San Juan.—p. 114.
Epidemiologic Study of Ascaris, Trichuris and Hookworm in Coastal Village in Puerto Rico. P. K. Nair, Trivandrum, Travancore State, South India.—p. 118.
Vitamin A Content of West Indian Shark (Carcharinus sp.) Liver Oil. C. F. Asenjo, L. M. Dalmau and J. H. Axtmayer, San Juan.—p. 158.

Treatment of Anemia Associated with Hookworm.—Rodríguez Molina's study of five cases suggests that iron administered in large daily doses (6 Gm.) is the treatment of choice in the anemia associated with hookworm disease as compared to liver extract with iron by mouth, to a widely known commercial preparation used in the treatment of secondary anemia, and to a well balanced full hospital diet. The administration of each of the therapeutic agents used during a period of thirty days without removal of the worms resulted in a rise of the red cell count and hemoglobin percentage to a practically constant subnormal level. This level was reached more quickly by patients receiving iron alone. After this rise there was no further significant increase previous to removal

of the worms. Administration of an anthelmintic was followed in all cases by a rapid (from five to seven days) increase in the red cell count to normal values. In the two patients who received iron alone a rapid increase in hemoglobin parallel to the increased red cell count was observed. It is inferred that intensive iron therapy and a well balanced and nutritious diet aided by an effective anthelmintic seem to provide the optimal conditions of a rapid recovery from the chronic anemia encountered in hookworm disease.

Radiology, Syracuse, N. Y.

25: 391-520 (Oct.) 1935

Biologic Measurement of Radium Gamma Rays. F. M. Exner and C. Packard, New York.—p. 391.
*Radiotherapy of Sarcoma of Soft Parts (on the Basis of Statistical Analysis). T. Leucutia, Detroit.—p. 403.
*Roentgen Treatment of Certain Types of Arthritis. L. H. Garland, San Francisco.—p. 416.
Effect of Irradiation of Pituitary in Dysmenorrhea. R. R. Newell and A. V. Pettit, San Francisco.—p. 424.
Localized Pleural Effusion Accompanying Congestive Heart Failure: Report of Two Cases. E. L. Shiflett, Indianapolis.—p. 429.
Blood Changes in Patients Having Carcinoma of Cervix of Uterus Irradiated with a Three Hundred Thousand Volt Roentgen Apparatus: Report of Nine Cases. S. Richman, New York.—p. 433.
Pathologic Rarities in Cancer: Two Unusual Cases. A. M. Sala, New York.—p. 437.
Xanthomatosis: Case of Schüller-Christian's Disease Treated by Irradiation. H. I. Teperson, Brooklyn.—p. 440.
Some Lawsuits I Have Met and Some of the Lessons to Be Learned from Them: Second Instalment. I. S. Trostler, Chicago.—p. 451.
Osteopoikilosis. C. G. Sutherland, Rochester, Minn.—p. 470.
New Technic for Roentgen Examination of Shoulder Joint. H. Jordan, New York.—p. 480.
Flatfoot: Consideration of Anatomy and Physiology of Normal Foot, Pathology and Mechanism of Flatfoot, with Resulting Roentgen Manifestations. M. Kaplan and T. Kaplan, New York.—p. 485.
Roentgen Mensuration by Stereoroentgenometry. C. R. Johnson, Los Angeles.—p. 492.
Congenital Bronchiectasis in Children. G. S. Reitter, East Orange, N. J. —p. 495.
Developmental Changes in Vertebral Articular Facets. J. G. Kuhns, Boston.—p. 498.

Radiotherapy of Sarcoma of Soft Parts.—In reviewing the statistical results in relation to the therapeutic method used in sarcoma of the soft parts, Leucutia finds that neither surgery nor radiation therapy has hard and fast rules. As concerns the former, though the general principle may be that every operable sarcoma should be removed at once, there are instances in which primary radiation therapy may appear of greater benefit. Especially is this true of some highly cellular sarcomas of the fibroblastic group, such as round cell sarcoma of the tonsil or any other location, reticulum cell sarcoma, large spindle cell sarcoma and the like, of the myxosarcomas, liposarcomas and xanthosarcomas and of the Kaposi sarcoma of the skin. Moreover, when biopsy is taken in all these instances it appears considerably safer to attempt to remove a metastatic node rather than to try to cut into the tumor proper. As concerns radiation therapy, the degree of radiosensitivity forms the basis of procedure. Yet radiosensitivity in the clinical sense may mean "spectacular" regression in one case and slow progressive tumor shrinkage in another. The criteria dominating such response must be closely scrutinized and classified. It will be found that in the majority of cases they may be harmonized to greater advantage with surgical indications and that, therefore, an association of surgical and radiotherapeutic methods in the treatment of sarcoma of the soft parts must constitute an essential and most desirable requirement. In the same sense, statistics dealing with a combination of the two methods rather than their opposition will prove of the greater clinical value.

Roentgen Treatment of Certain Types of Arthritis.—Garland believes that, besides being contraindicated in arthritis in patients with cardiac disturbances, marked arteriosclerosis and nephritis, pyrotherapy appears to be more uncertain in its results than roentgen therapy. He treated nine cases of acute infectious arthritis, in which a total of thirteen individual joints were involved. Four patients became free from symptoms, two were considerably improved and three were not improved. Absence of the immediate and often spectacular relief that occurs in cases of gonorrheal arthritis was conspicuous. Three cases of chronic infectious arthritis were treated, in which ten individual joints were involved. Two cases became free from symptoms and one was not improved at all. Seven cases of chronic degenerative arthritis of the spine (spondylitis deformans) were treated. Only one became symptom free, four were improved and one was not improved. Thirty cases of acute infectious (gonorrheal) arthritis were treated with small doses of x-rays delivered to the involved joints twice weekly for two or three weeks. Twenty-eight cases (93 per cent) were much improved and two (7 per cent) were unimproved. Approximately half of the improved cases appeared to be completely cured within a few weeks of the end of treatment; the remaining cases improved gradually, but, while there was freedom from pain, some slight stiffness or disability remained in the involved joints. Five patients, in whom the joints were left untreated as controls, showed no improvement in the joints that were not treated.

Southern Medical Journal, Birmingham, Ala.

28: 959-1074 (Nov.) 1935

Neurologic Hyperinsulinism. S. Harris, Birmingham, Ala.—p. 959.
Injuries to Ureters. K. D. Lynch and R. F. Thompson, El Paso, Texas. —p. 965.
Unilateral Fused Kidney with Calculus: Case Report. H. J. Lindner, New Orleans.—p. 972.
Bronchoscopy and Esophagoscopy with Presentation of Some Interesting Problems. S. Israel, Houston, Texas.—p. 974.
Discussion of Essential Procedures Employed in Diagnosis of Diseases of Esophagus. E. B. Freeman, Baltimore.—p. 981.
Phytobezoar Diospyri Virginianae: Report of Two Cases. H. C. Schmeisser, Memphis, Tenn.—p. 987.
Open Reduction for Fractures and Dislocations: Indications and Methods. H. R. Mahorner, New Orleans.—p. 993.
Treatment of Creeping Eruption. J. L. Kirby-Smith, Jacksonville, Fla. —p. 999.
Allergic Conjunctivitis. R. M. Balyeat and R. Bowen, Oklahoma City. —p. 1005.
Allergic Ocular Manifestations. M. Wiener, St. Louis.—p. 1011.
Analysis of One Hundred and Fifty-One Consecutive Fetal and Neonatal Deaths During an Eight Year Period at the Southern Baptist Hospital of New Orleans. T. B. Sellers and J. T. Sanders, New Orleans.—p. 1017.
Prevention of Birth Injuries. C. R. Hannah, Dallas, Texas.—p. 1021.
Conflict and Physical Symptoms. M. S. Gregory, Oklahoma City. —p. 1023.
Brief Consideration of Radical Surgery in Paranasal Sinuses. J. W. Jervey, Greenville, S. C.—p. 1026.
Mesenteric Cyst: Case Report. L. G. Livingston, Cordell, Okla. —p. 1028.

Tennessee State Medical Assn. Journal, Nashville

28: 403-444 (Oct.) 1935

Clinical Application of Some Recent Studies on Gastric Secretion. L. Martin, Baltimore.—p. 403.
Pathologic Uterine Bleeding. W. C. Dixon, Nashville.—p. 410.
Diverticulitis of the Colon. C. H. Heacock, Memphis.—p. 416.
Diagnosis and Treatment of Intestinal Obstruction. E. G. Kelly, Memphis.—p. 423.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

43: 535-596 (Oct.) 1935

Twenty Years' Experience in Management of Goiter. E. C. Moore and H. D. Van Fleet, Los Angeles.—p. 535.
Etiology and Management of Recurrent Hyperthyroidism. G. S. Fahrni, Winnipeg, Manit.—p. 542.
Riedel's Struma. A. M. Boyden, F. A. Coller and J. C. Bugher, Ann Arbor, Mich.—p. 547.
Myxedema: Spontaneous and Postoperative. S. D. Conklin, Sayre, Pa. —p. 564.
Some Problems in Thyroid Disease. F. E. Rogers, Denver.—p. 576.
*Thyroidectomy for Hyperthyroidism with Manic Depressive Psychosis. L. D. Long, Oklahoma City.—p. 583.
Adequate Anterior Approach for Removal of Cervicodorsal Sympathetic Ganglions. P. G. Flothow, Seattle.—p. 589.

Thyroidectomy for Hyperthyroidism with Manic Depressive Psychosis.—To explain the development of psychosis in connection with hyperthyroidism, Long calls attention to the supposed rôle of the thyroid in controlling cerebral circulation. In hyperthyroidism there are tachycardia, increased arterial tension and increased metabolism. It is reasonable that in connection with these phenomena there might be an increase of the blood supply to the brain to the extent that mental disturbances would be produced. The etiologic rôle of the toxic products of hyperthyroidism should be considered also. If this reasoning is sound, it follows that thyroidectomy ought to be followed by a modification of the abnormal cerebral circulation and by a reduction of toxic material going to the

brain. The author has seen a few patients who had so-called thyroid psychosis (toxic psychosis), which appeared at the height of hyperthyroidism, either shortly before or ofter operation, and was quickly alleviated by control of the hyperthyroidism, by administration of iodine or operation, or by both. The three cases that they report have not been of this type but have instead exhibited long standing frank manic depressive psychosis before operation, which cleared up slowly following thyroidectomy. The period of active postoperative psychiatric treatment has averaged two years, but at the end of that time these patients have been regarded as mentally cured. This belief exists with the full knowledge that manic depressive psychosis, untreated, shows remissions. In each of these the mental and physical results have been so satisfactory that the author feels that thyroidectomy is worth while and is a means of securing permanent relief from the physical, and apparently permanent relief from the mental, disturbances. These patients, who have been under the careful observation of competent mental experts, are said to be mentally cured and are now leading healthy useful lives.

West Virginia Medical Journal, Charleston

31: 485-532 (Nov.) 1935

President's Address: Hospitalization in West Virginia Today: Its Future. J. A. McClung, Richwood.—p. 485.
The Medical Profession and the Hospital. R. H. Walker, Charleston.—p. 495.
Bluefield Periodic Payment Plan of Providing Hospital Care. R. O. Rogers and W. A. McCue, Bluefield.—p. 504.
The Status of Hospitals in Medical Relief Setup. B. H. Swint, Charleston.—p. 509.
The Hospital and the Community. J. J. Swint, Wheeling.—p. 512.
Causes of Stillbirth and Neonatal Death. C. C. Fenton, Morgantown.—p. 513.

Yale Journal of Biology and Medicine, New Haven

8: 1-112 (Oct.) 1935

Limiting Factors in Advancement of Science as Observed in History of Embryology. J. Needham, Cambridge, England.—p. 1.
Congenital Pericardial Deficiency with Other Anomalies: Report of Case with Necropsy Findings. D. S. Egbert and S. Little, New Haven, Conn.—p. 19.
*Renal Changes in Hypertension. H. E. MacMahon, Boston.—p. 23.
Electrical Characteristics of Living Systems. H. S. Burr and C. T. Lane, New Haven, Conn.—p. 31.
Fundamental Factors for Delay and Nonunion in Fractures. D. S. O'Connor, New Haven, Conn.—p. 37.
Elisha Perkins and His Metallic Tractors. W. S. Miller, Madison, Wis.—p. 41.
Fat Embolism. H. H. Groskloss, Philadelphia.—p. 59.

Renal Changes in Hypertension.—MacMahon discusses the renal changes in "primary" hypertension. A study of a large number of cases belonging to the group of "primary" hypertension shows that one is not dealing with a single but with several clinical syndromes. Four groups are considered: (1) temporary hypertensions of young and middle-aged persons observed during certain of the toxemias of pregnancy, (2) permanent hypertension uncomplicated by clinical signs and symptoms as seen in young individuals, (3) permanent hypertension of middle-aged and elderly persons associated with a variable degree of generalized arteriosclerosis and (4) permanent, though variable, hypertension in young and middle-aged individuals associated with destructive and inflammatory lesions throughout the body—known as malignant nephrosclerosis. Patients having temporary hypertension during toxemia of pregnancy may develop in later years the classic signs and symptoms of malignant nephrosclerosis. The great majority of patients of the second group ultimately fall into one or the other of the two remaining groups: benign or malignant nephrosclerosis. This might suggest a link in common between these groups and indicate that they are not different diseases but only different phases of the same disease. In favor of such a hypothesis, perhaps, is the indisputable fact that borderline and transitional forms do occur which do not fall clearly into any one of these four groups. These impressions, however, in no way contradict the observation that, at least on the basis of morphologic pathology, each may exist as a distinct and separate disease but rather suggest that from the standpoint of etiology certain factors may be common to all.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Experimental Pathology, London

16: 435-496 (Oct.) 1935

Relationship Between Serologic Reactions and Infectivity of Potato Virus X. F. C. Bawden.—p. 435.
*Experimental Anemia in Monkeys, with Especial Reference to Macrocytic Nutritional Anemia. Lucy Wills and Alice Stewart.—p. 444.
Bacteria Aertrycke Endotoxin: Study on Its Production, Detoxication and Practical Utilization of Its Antigenic Properties. E. Grasset, A. Zoutendyk and A. Schaafsma.—p. 454.
Effect of Certain Constituents of Culture Medium on Production of Diphtheria Antitoxin in Normal and Immunized Guinea-Pigs. P. Hartley.—p. 460.
Effect, on Degree of Immunity Produced, of Injecting Same Dose of Diphtheria Formol Toxoid Contained in Different Volumes of Normal Salt Solution. P. Hartley.—p. 468.
Effect of Injury on Level of Plasma Proteins: Note. D. P. Cuthbertson and S. L. Tompsett.—p. 471.
Relationship Between Heterophile Hapten and Specific Polysaccharide Hapten of "Smooth" Form of Bacterium Shigae. K. Meyer and W. T. J. Morgan.—p. 476.
Application of Specific Levulose Determinations to Levulose Tolerance Test. L. D. Scott.—p. 489.

Experimental Anemia in Monkeys.—The experiments of Wills and Stewart show that the hematopoietic system of the rhesus monkey behaves in a manner remarkably similar to that of man. Only the bone marrow hypertrophy in macrocytic anemia in monkeys differs from that in man. The megaloblastic reaction was similar to that seen in pernicious and other human macrocytic anemias, but the large, pale primitive cells, which were present in such large numbers in the marrow from some of the animals, are not commonly seen in preparations from human material. These cells were found in greatest number in the bone marrow from a monkey that died during a blood crisis, during which numerous nucleated red cells appeared in the blood stream, and they would appear to be stem cells, though their relation to the red and white cell series could not be determined from preparations (since identified by Turnbill as leukoblastic cells of the neutrophil series). No consideration of macrocytic anemia in animals should fail to include the possibility of a Bartonella infection. Thus a macrocytic anemia has been produced in intact rats on deficient diets. This anemia, however, was accompanied by the appearance of Bartonella bodies in the circulating blood, and, while many animals died in the acute stage of the illness, those that survived made a spontaneous recovery, the anemia disappearing without any specific treatment (Wills and Mehta, 1930). Recently also Miller and Rhoads (1935), who have induced a macrocytic anemia in dogs by faulty feeding, have reported the finding of Bartonella canis in their experimental cases after splenectomy. The interpretation of this is obscure, as the Bartonella bodies were never found in nonsplenectomized animals fed on the same faulty diet, even after they had received injections of blood from the infected animals. Moreover, the infected animals could be cured of their anemia, with the disappearance of the Bartonella bodies, by adding lean meat to the diet. The question of whether a latent Bartonella infection is present in the monkeys has not been determined.

British Journal of Radiology, London

8: 601-668 (Oct.) 1935

*Radiologic Estimation of Fetal Maturity. R. E. Roberts.—p. 601.
Fetal Cephalometry. L. A. Rowden.—p. 610.
Id.: Simple and Exact Method of Determining Biparietal Diameter of Fetal Head in Utero. C. L. McDonogh.—p. 613.
Behavior of Oscillating Currents in Complex Circuits. P. Bauwens.—p. 615.
Depth Doses of X-Rays. L. H. Clark and E. W. Chapman.—p. 625.
Description of X-Ray Couch, Designed for Use on Field Service, Incorporating New Type of Localizing Device. H. E. Yorke.—p. 637.
Variations in Sensitivity of Cell to Radiation in Relation to Mitosis. J. C. Mottram.—p. 643.
Direct X-Ray Cinematography: Preliminary Note on Nature of Nonpropulsive Movements of Large Intestine. A. E. Barclay.—p. 652.

Radiologic Estimation of Fetal Maturity.—Roberts describes a method for estimating the maturity of the fetus from certain cephalic diameters. The patient is placed in the prone position, the weight resting on the elbows, with a caset beneath her. If not already in contact, the hypogastrium is

brought into contact with the caset. The x-ray tube is centered above the fetal head at a distance of 4 feet and a roentgenogram is taken (50 milliamperes at 60 kilovolts, three seconds). The suboccipitobregmatic diameter is most frequently seen on the film and can be measured by a ruler (preferably of the transparent type) marked off in tenths of an inch. (Failing this, the diameter intermediate between the suboccipitobregmatic and biparietal will be seen and measured or, more rarely still, the biparietal diameter itself). The diameter in inches so measured multiplied by 10 will give in the majority of cases a fairly accurate estimate of the fetal maturity. For instance, a suboccipitobregmatic diameter of 3 7/10 inches will in an average case indicate a fetal maturity of thirty-seven weeks. If the patient is fat, or if it is impossible to bring the hypogastrium into contact with the caset, or if a lateral view shows the position of the head to be occipitoposterior, a week or, in extreme cases, two weeks should be deducted from the maturity computed. The method is recommended only for single vertex presentations. If difficulty is experienced in roentgenography at 4 feet without a Bucky diaphragm, a formula and table are given for estimating the maturity from the prone Potter-Bucky roentgenograph at 30 inches. If the Potter-Bucky diaphragm is used, the film should be 1½ inches from the surface of the Bucky table. The author presents this method as a preliminary note. There has as yet been insufficient time or opportunity to test out the method in a large number of cases. From the small number of cases examined, however, he feels that it will be of help.

British Journal of Surgery, Bristol

23: 241-480 (Oct.) 1935

Traumatic Hemangiomatous Tumors of Skeletal Muscle. R. Mailer.—p. 245.
Hemangioma of Voluntary Muscle: Brief Review of Literature: Two Cases. E. N. MacDermott.—p. 252.
History of Plaster of Paris in Treatment of Fractures. J. K. Monro.—p. 257.
*Hemorrhage per Rectum as Indication of Disease in Meckel's Diverticulum. J. T. Chesterman.—p. 267.
Intussusception of Jejunum into Stomach Through Gastro-Enterostomy Stoma. J. A. M. Cameron and W. D. Macfarlane.—p. 274.
Further Note on Development of Cysts in Connection with Semilunar Cartilages of Knee Joint. R. Ollerenshaw.—p. 277.
Nature and Recognition of Endothelium, with Especial Regard to Silver Methods of Staining. C. E. Jenkins.—p. 279.
Angioma of Kidney: Report of Case with Analysis of Twenty-Six Previously Reported Cases. R. H. J. Swan and H. Balme.—p. 282.
*Thrombosis Following Strain. R. H. O. B. Robinson.—p. 296.
Late Results of Operations on Biliary Tract in Three Hundred and Fifty-Nine Cases, with Cholecystographic Studies in Eighteen. J. H. Saint.—p. 299.
Traumatic Rupture of Congenital Solitary Kidney. J. R. H. Turton and J. C. F. L. Williamson.—p. 327.
Squamous Cell Carcinoma of Renal Pelvis: Report of Case. M. Silverstone.—p. 332.
Sacrococcygeal Cysts and Tumors. R. W. Raven.—p. 337.
Pylephlebitis Complicating Appendicitis and Its Treatment by Ligature of Mesenteric Veins. A. M. Stewart-Wallace.—p. 362.
Intestinal Obstruction by Gallstones. C. P. G. Wakeley and F. W. Willway.—p. 377.
*Lymphatic Spread in Cancer of Rectum. W. B. Gabriel, C. Dukes and H. J. R. Bussey.—p. 395.
Rôle of Sympathectomy in Treatment of Peripheral Vascular Disease. R. I. Harris.—p. 414.
Peripheral Sympathetic Nervous System. H. H. Woollard.—p. 425.
Results of Sympathectomy: Analysis of Cases Reported by Fellows of Association of Surgeons. J. P. Ross.—p. 433.
Central Control of Sympathetic Nervous System. J. Beattie.—p. 444.
Technic of Sympathectomy. E. D. Telford.—p. 448.

Rectal Hemorrhage and Meckel's Diverticulum.—Chesterman reports four cases of rectal hemorrhage due to peptic ulcer of Meckel's diverticulum. The ages of the patients were 6, 11, 16 and 22 years. From the available literature the etiology of all forms of bleeding due to disease of this diverticulum is given together with the differential diagnosis. The following, in their order of frequency, may be associated with the hemorrhage from the rectum: anemia, pain, vomiting and intestinal irregularity. The diagnosis is made by a process of exclusion, though rectal hemorrhage in a juvenile between the ages of 5 and 15 years, especially if a boy, is very suggestive. The hemorrhage is usually sudden and severe, though in cases of growth it may be slight and continuous. Pain occurs in about half the cases, is of colic type and never severe and prolonged unless associated with intestinal obstruction and is situated in the umbilical region. Laparotomy for the removal of an ulcer-containing diverticulum is urged in children between the ages of 5 and 15 years showing rectal hemorrhage the cause of which is not revealed by sigmoidoscopy and blood examination.

Thrombosis Following Strain.—Robinson has seen two cases of primary thrombosis, the result of excessive muscular effort, affecting the thoraco-epigastric vein of the right side. The patients were healthy and in the prime of life; there was little subcutaneous fat, so that the vein was both visible and palpable. In one the condition developed after digging in the garden, and in the other after shifting some heavy furniture. The symptoms were pain felt in the side of the chest wall and the discovery of a tender cord. On examination a stringlike band under the skin, running up from the costal margin just behind the breast under the anterior axillary fold and disappearing in the axilla, was palpable and tender. The physical signs cleared up completely in six weeks. The condition is of clinical interest, particularly in the female sex, because its close relationship to the breast may give rise to confusion in diagnosis. As a cause of thrombosis one can postulate congestion and injury of the venous intima during contraction of the underlying muscles, possibly with injury of the valves in the lumen of the vein. It is possible that axillary thrombosis may originate in this vein, the primary thrombosis being overlooked in the major condition affecting the axillary vein, especially as it is unlikely that the patient will draw attention to the original condition.

Lymphatic Spread in Cancer of Rectum.—Gabriel and his co-workers discuss a means for the examination of operative specimens of cancer of the rectum in order to determine the extent of lymphatic spread. As a rule the regional lymph nodes are the first to be affected by metastases in cancer of the rectum. Lymphatic spread then proceeds from below upward along the chain of glands accompanying the superior hemorrhoidal artery. Irregular or interrupted spread is uncommon. Lateral or downward lymphatic spread is found only in a late stage of the disease when the hemorrhoidal lymphatics are blocked by metastases. The examination of the operative specimens permits a distinction to be made between cases in which glandular spread has already reached the glands at the point of ligation of the inferior mesenteric pedicle and those in which the upward spread has not extended to this point. The prognosis in the latter is thought to be much better than in the former. In the 100 glands dissected the authors found lymphatic metastases in sixty-two cases. This is a slightly higher proportion than is usually reported in any series of operation specimens of cancer of the rectum. The dissection of seventy specimens removed by perineo-abdominal excision showed that in only a small proportion (eleven) the disease had actually spread by lymphatic channels to the limit of surgical removal; that is, the inferior mesenteric pedicle.

British Journal of Tuberculosis, London

29: 191-254 (Oct.) 1935

*Why Do Relapses Occur in Pulmonary Tuberculosis? R. C. Wingfield.—p. 193.
The Mantoux Test: Comparison of Old Tuberculin with Tuberculin Prepared on Synthetic Protein Free Medium. G. G. Kayne.—p. 201.
Examination of Blood by Loewenstein's Method for Presence of Bacillus Tuberculosis. J. W. Edington.—p. 210.
The Arrested Case of Tuberculosis in the Village Settlement. J. B. McDougall.—p. 216.
Influence of High Altitudes on General Health and Reconvalescence After Acute Illness. B. Hudson.—p. 223.
Inhalation Therapy in Pulmonary Tuberculosis. G. B. Charnock.—p. 227.
Contribution to Study of Oleochrysotherapy: One Hundred Cases of Pulmonary Tuberculosis Treated in a Sanatorium by Suspensions of Gold Salts in Oil. M. Gilbert and A. Miege, translated by Margaret V. Saul.—p. 232.
Immediate Results in One Hundred Patients to Whom Gold Salts Were Given. H. Roche.—p. 244.

Relapses in Pulmonary Tuberculosis.—Wingfield states that there are three forms of relapse. They differ completely in their pathology, symptomatology, recognition, prevention and treatment: 1. Relapse due to the deposition of an entirely fresh lesion in a heretofore undiseased portion of the lung—new lesion relapse. 2. Relapse due to spread by contiguity of a heretofore quiescent or arrested lesion—spread relapse. 3. Relapse due to

changes taking place in an apparently arrested lesion, unaccompanied by actual spread of the diseased area—late relapse. The pathology, etiology, clinical evidence, physical signs, appearances, clinical course, recognition and treatment of each type are discussed.

British Medical Journal, London

2: 771-828 (Oct. 26) 1935

Some Epochs in Medical Research. H. Dale.—p. 771.
Esophageal Obstruction. H. S. Souttar.—p. 777.
Premedication. F. W. Green.—p. 780.
Sinusitis in Children. G. C. Scantlebury.—p. 781.
Low Voltage X-Ray Therapy: Preliminary Note. W. Morison, D. Hugo and W. V. Mayneord.—p. 783.

East African Medical Journal, Nairobi

[12]: 199-226 (Oct.) 1935

Endemicity of Plague in East Africa. J. I. Roberts.—p. 200.
Anencephaly with Hydramnios: Case. R. B. Michener.—p. 219.

Journal of Anatomy, London

70: 1-202 (Oct.) 1935

Nerve Cells in Spinal Ganglions. D. M. Blair, P. Bacsich and F. Davies.—p. 1.
Innervation of Kidney, Ureter, Testicle and Epididymis. G. A. G. Mitchell.—p. 10.
Consideration of Constancy of Muscular Nerve Supply. R. W. Haines.—p. 33.
Evolution of Human Foot, with Especial Reference to Joints. H. Elftman and J. Manter.—p. 56.
Development of Prepuce: Notes. R. H. Hunter.—p. 68.
Studies on Area Vasculosa of Embryo Chick: I. First Differentiation of Vitelline Artery. A. F. W. Hughes.—p. 76.
Sex Difference in Proportion of Suprarenal Cortex Occupied by Lipoid in Guinea-Pigs Over One Year Old. R. Whitehead.—p. 123.
Study of Adrenal Cortex of Rabbit. R. Roaf.—p. 126.
Detailed Study of Movement of Wrist Joint. R. D. Wright.—p. 137.
Changes in Alveolar and Demilune Cells of Simple and Stimulated Paralytic Submaxillary Gland of Cat. H. E. Rawlinson.—p. 143.
Patterns of Aortic Arch in Series of One Hundred and Thirty-Three Macaques. C. F. De Garis.—p. 149.
Further Abnormalities in Blood Vascular System of Frogs. C. H. O'Donoghue.—p. 159.

Journal Obst. & Gynaec. of Brit. Empire, Manchester

42: 733-952 (Oct.) 1935

Upper Urinary Tract in Pregnancy and Puerperium, with Especial Reference to Pyelitis of Pregnancy. D. Baird.—p. 733.
*Significance of Shape of Fetal Head in Mechanism of Labor. E. Rydberg.—p. 795.
*Some Observations on Malaria Occurring in Association with Pregnancy, with Especial Reference to Transplacental Passage of Parasites from Maternal to Fetal Circulation. G. A. W. Wickramasuriya.—p. 816.
Thymophysin Question: Observations Based on Eighteen Hundred and Fifty Cases. K. Heyrowsky.—p. 835.
Carcinomatous Change in Polyp of Uterine Body. D. M. Vaux.—p. 845.
Spontaneous Rupture of Uterus During Pregnancy. H. H. Fletcher.—p. 848.
Treatment of Posthemorrhagic State. W. Hunter.—p. 852.
Prognosis in Carcinoma of Cervical Stump After Subtotal Hysterectomy: Critical Analysis of Thirty-Eight Cases. J. R. Nuttall and T. F. Todd.—p. 860.
Acute Inversion of Uterus: Two Cases. M. L. Treston.—p. 867.
Fatal Case of Pregnancy Complicated with Mumps. P. C. Dutta.—p. 869.
Anephrogenesis. F. J. S. Gowar.—p. 871.

Significance of Shape of Fetal Head.—Rydberg gives a historical survey and a critical examination of theories advanced in explanation of the mechanism of labor; heretofore no generally accepted explanation has been found. His investigation of the shape of the fetal head shows that it has a decided and characteristic asymmetry, in that the bulk of its mass is situated above the mento-occipital diameter. An investigation as to how this asymmetry may be conceived as determining the movements of the head during labor shows that the usual mechanism can be traced to it, if it is assumed that the deformability of the birth canal corresponds on the whole with that of a curved tube of a homogeneous elastic material. Cases in which the normal internal rotation is absent are also explained, if the atypical deformation of the fetal head appearing in these cases is obvious. The author believes that the shape of the fetal head is the factor which chiefly determines its movements during labor, and that an incomplete forward flexibility of the fetus at most may have some importance in cases of prolonged occipitoposterior position. He states that the hypothesis is in itself reasonable and is supported by what can be observed during obstetric work. The movements of the fetal head during labor are fully explained by its shape alone. The conception that the shape of the head is the essential and decisive factor is strongly supported by all obstetric experience, which testifies unmistakably as to the dominating importance of the head for the whole course of labor under both normal and pathologic conditions, and to the high degree of plasticity and passivity of the fetal body and neck.

Malaria During Pregnancy.—Wickramasuriya asserts that quinine is still indispensable in the treatment of malaria in gravid as well as nongravid women. Pregnancy is not a contraindication to its use. Clinical experience does not suggest that quinine administered in therapeutic doses possesses oxytocic powers. Far from being an oxytocic, quinine administered in effective therapeutic doses, by rapidly controlling the malarial infection and the high temperature, prevents premature interruptions of pregnancy and intra-uterine fetal death. Atabrine is regarded by many as an alternative to quinine in the treatment of malaria during pregnancy. While it should be regarded as a useful addition to the therapeutic armamentarium, it must be said to occupy but a subordinate place to that of quinine in the treatment of the disease during pregnancy, as it does not control the malarial infection and the high temperature so rapidly. Relapses do occur after its use as with quinine, and whether it is as efficacious and as safe for general use as quinine is yet to be seen. Atabrine appears to be contraindicated in patients with toxemia of pregnancy, preexisting nephritis and advanced hookworm disease.

Journal of Physiology, London

85: 117-276 (Oct. 26) 1935

Occurrence of Several Kinds of Hemoglobin in Human Blood. R. Brinkman and J. H. P. Jonxis.—p. 117.
Some Physiologic and Physical Aspects of Surface Tension of Urine. P. W. Perryman and C. F. Selous.—p. 128.
Action of Ovarian Hormones on Uterine Muscle Measured in Vivo and in Vitro. J. M. Robson.—p. 145.
Separation of Pubic Bones Following Administration of Estrogens to Male Mice. H. Burrows.—p. 159.
Effect of Food and of Exhaustion on Pituitary, Thyroid, Adrenal and Thymus Glands of Rat. Dorothy H. Andersen.—p. 162.
*Effects of Sodium Citrate on Alkali Reserve and Coagulability of Blood. D. de Souza and F. D. M. Hocking.—p. 168.
Changes in Coagulability of Blood Produced by Citric Acid and Some of Its Decomposition Products. D. de Souza and F. D. M. Hocking.—p. 173.
Action Potential of Superior Cervical Ganglion. J. C. Eccles.—p. 179.
Facilitation and Inhibition in Superior Cervical Ganglion. J. C. Eccles.—p. 207.
Carbohydrate Metabolism of Gut Muscle. B. N. Prasad.—p. 239.
Mechanical Activity of Gut Muscle Under Anaerobic Conditions. B. N. Prasad.—p. 249.
Afferent Fibers from Abdomen in Vagus Nerves. A. A. Harper, B. A. McSwiney and S. F. Suffolk.—p. 267.

Effects of Sodium Citrate on Alkali Reserve.—As the results of the intravenous injections depend on the amount of citrate injected and as intramuscular injections are given to make the blood more coagulable, de Souza and Hocking believe that it is important to know whether the effects of the intramuscular injections, both on the coagulability of the blood and on the alkali reserve, show a similar dependence on the quantity of citrate. Their results show that an intramuscular injection of 0.125 Gm. per kilogram of body weight may be safely and effectively given to increase the coagulability of the blood, but that an injection ten times as large eventually diminishes coagulability and may in certain circumstances produce tetany. Repeated small intramuscular injections of sodium citrate have a cumulative effect in increasing the alkali reserve and the coagulability of the blood. Anesthetized cats were used for the experiments.

Journal of State Medicine, London

43: 559-620 (Oct.) 1935

Tuberculosis of the Knee Joint. C. L. Pattison.—p. 559.
Increase of Tuberculosis in Young Female Adult. W. S. Gilmour.—p. 567.
Elimination of Tuberculosis from Milk Supply. D. S. Rabagliati.—p. 576.
Rheumatism in Industry. C. W. Buckley.—p. 587.
Spa Treatment in Industrial Diseases. A. Cox.—p. 596.
Study of Weather and Climate in Relation to Public Welfare. L. C. W. Bonacina.—p. 611.

Journal of Tropical Medicine and Hygiene, London

38: 249-264 (Oct. 15) 1935

Some Newer Aspects of Schistosome Infection in the Western Hemisphere. E. C. Faust.—p. 249.
Treatment of Staphylococcus Infections with Staphylococcus Toxoid. M. A. Gohar.—p. 259.

Lancet, London

2: 869-926 (Oct. 19) 1935

*Bacteremia and Oral Sepsis, with Especial Reference to Etiology of Subacute Endocarditis. C. C. Okell and S. D. Elliott.—p. 869.
Acholuric Jaundice: Serial Onset of Acute Blood Crises in Entire Family. A. M. Scott.—p. 872.
Hodgkin's Disease in Natives of Nigeria: Results of Biologic Test. E. C. Smith.—p. 874.
Congenital Defect of Sternum: Case. A. Jordan.—p. 877.
Internal Pneumolysis: Results of One Hundred and Ten Consecutive Operations. F. G. Chandler.—p. 879.
Perforation of Tuberculous Intestine in Pulmonary Tuberculosis: Report of Two Cases. D. B. Rosenthal.—p. 882.

Bacteremia and Oral Sepsis.—In searching for the source of streptococci concerned in the production of subacute bacterial endocarditis, Okell and Elliott state that attention must inevitably be turned to the oral cavity. The majority of endocarditis streptococci are of the salivary or Streptococcus viridans type. These abound in the mouth and its neighborhood but are found elsewhere only in small numbers and under exceptional conditions; above all it is in conditions of oral sepsis, such as pyorrhea of the gums, that this type of streptococcus is found in the greatest numbers. The blood was examined for bacteria in 138 patients undergoing extraction of teeth. Eighty-four of these showed a transient streptococcic bacteremia after extraction, and in cases considered to be of a severe type of oral sepsis (group A) the positive streptococcus cultures reached as high a figure as 75 per cent. In all cases from which streptococci were recovered, the organisms were of the nonhemolytic type. In the majority of cases in which the result was positive, streptococci were recovered from the cultures grown under aerobic and anaerobic conditions of cultivation, and in a few instances the organisms were found in the aerobic or anaerobic cultures. None of the streptococci recovered were obligatory anaerobes. In general, it was found that the occurrence and degree of a bacteremia depended on the severity of the disease of the gums and the amount of damage done at the operation. The bacteremia following extraction is of short duration. The transient bacteremia following operative trauma is analogous with that described by Barrington and Wright in catheter fever in which Bacillus coli was the usual organism isolated from the blood. In persons with severely septic mouths, nonhemolytic streptococci (mostly of the viridans type) may enter the blood stream in the absence of any obvious trauma. The authors have been unable to ascertain whether the condition of "leak" into the blood stream in the positive cases is continuous, intermittent or merely a fortuitous single occurrence. Nor have they yet determined whether minor traumas, such as brushing the gums or chewing, have any effect on the occurrence of the bacteremia. The efficient mechanism, which exists for clearing the blood stream of organisms of low virulence, no doubt allows a leak of organisms into the circulation to be detectable in blood from an arm vein only when the leak exceeds a certain magnitude or the organisms are abnormally resistant to phagocytic clearing. The leak, which is of little consequence in the normal person, might determine the infection of diseased or malformed valves. The direct observation of such an invasion of blood provides a tentative explanation of how streptococci reach the cardiac valves in cases of subacute bacterial endocarditis.

South African Medical Journal, Cape Town

9: 625-656 (Sept. 28) 1935

Microcallosal Brain: Discussion of Rôle of Corpus Callosum in Cerebration. M. R. Drennan.—p. 625.
Some Observations on Control of Infectious Disease. F. A. Donnolly and H. Nelson.—p. 629.
Results of One Hundred Friedman Pregnancy Tests: Notes on Two Informative Cases. W. Lewin.—p. 641.
Tuberculosis of Bones and Joints in Native Patients in the Ciskei. N. Macvicar.—p. 643.
Recent Views on Brucella Group. E. M. Robinson.—p. 645.
Blood Groups of the Hottentot. R. Elsdon-Dew.—p. 651.
Intestinal Myiasis Caused by Larvae of Chrysomyia Chloropyga, Wiedemann (Diptera, Calliphorinae). B. de Meillon and H. S. Osburn.—p. 654.

Journal de Chirurgie, Paris

46: 657-848 (Nov.) 1935

*Interlumbosacral Sympathicotomy in Trophic Disorders of Lower Limbs. D. Danielopolu, A. Aslan and I. Marcou.—p. 657.
Cholecystogastrostomy and Gastric Ulcer. P. Mallet-Guy and P. Van Der Linden.—p. 676.
Experimentation on Changes of Vesicular Mucous Secretion Resulting from Cholecystogastrostomy. P. Mallet-Guy, M. Chambon, P. Van Der Linden and P. Croizat.—p. 684.
Action of Different Metals on Osseous Tissue. G. Menegaux and D. Odiette.—p. 695.
Resection of Splanchnic Nerves: Critical Review. J. Meillère and J. Bréhant.—p. 727.

Sympathicotomy in Trophic Disorders of Lower Limbs.—Danielopolu and his associates practiced interlumbosacral sympathicotomy in cases of arteritis of the lower extremities. It consists in sectioning of the sympathetic cord above the promontory. They feel that this procedure is preferable to lumbar sympathectomy for several reasons. It satisfies the necessary physiologic and anatomic principles and is technically relatively easy to perform without producing the occasional paralytic ileus of some of the other methods.

Presse Médicale, Paris

43: 1561-1576 (Oct. 9) 1935

Diagnosis of Kala-Azar by Dermal Scrapings. E. Benhamou.—p. 1561.
Treatment of Acute Corrosive Esophagitis. S. Bélinoff.—p. 1564.
*Lack of Importance of Stasis in Pathogenesis of Biliary Lithiasis. I. Pavel.—p. 1565.
New Method of Gastro-Enterostomy. Robert-Didier.—p. 1568.

Stasis in Pathogenesis of Biliary Lithiasis.—Pavel advances several arguments which militate against the generally accepted concept that stasis is a necessary prerequisite to the formation of gallstones. There have been numerous cases of prolonged biliary stasis, confirmed by operation or necropsy, without any development of stones. Furthermore, recent studies of icterus from functional stasis due to spasm of the sphincter of Oddi have shown that it does not favor the formation of calculi. Cholecystography has furnished additional evidence of this view. There are numerous instances in which atony of the gallbladder has been found without any stones. On the other hand, vesicles have been seen showing normal contractile powers, but nevertheless containing stones. The author feels that all these observations tend to prove that the classic idea of stasis should no longer be accepted uncritically.

43: 1601-1624 (Oct. 16) 1935

*Hyperpolypeptidemia in Course of Tetanus. H. Warembourg and J. Driessens.—p. 1601.
Evacuation Puncture of Serofibrinous Pleurisies in Therapeutic Pneumothorax. D. Micheti and A. Roulet.—p. 1605.

Hyperpolypeptidemia in Tetanus.—Warembourg and Driessens describe three cases of tetanus. One patient, after being accepted as having recovered from his infection, died later of uremic coma, and the other two patients, before dying of tetanus, showed signs of grave blood uremia with marked hyperpolypeptidemia. The cause was investigated from a clinical, chemical and morphologic standpoint, but the authors were unable to relate this to any deficiency in blood chlorides. Systematic histologic study of the organs was practiced with the aim of determining any preexisting chronic disorder of the liver or kidneys or any acute lesion of these organs that might play a part in the uremia. No old lesions were found at first, but acute and subacute changes of great importance were noted. The authors therefore concluded that the important etiologic factor was probably the continuous administration of strong doses of serum loaded with foreign proteins. The resulting increase in the blood urea, nonprotein nitrogen and polypeptides coincides with an intense congestive hepatitis and nephritis. The final responsibility of the therapeutic maneuvers in the determination of this intoxication remains to be clarified. Certain practical conclusions may be drawn, nevertheless. Naturally, antitoxins must still be administered, but the course of the blood urea should be watched, diuresis should be favored by the administration of isotonic or hypertonic dextrose solution, the patient may be given liver extracts, and the antitoxin that is administered should be as free as possible from heterogenous proteins.

Schweizerische medizinische Wochenschrift, Basel

65: 1041-1064 (Nov. 2) 1935. Partial Index

Male and Female Hormone. E. Laqueur.—p. 1041.
*Interreno-Insular Syndrome: Is There a Primary Polynesia That Leads to Fatal Cachexia? M. Askanazy and F. Sciclounoff.—p. 1046.
Treatment of Tumors of Bladder. K. Egger.—p. 1051.
Casuistic Contribution to Therapy of Gastric Ulcers. F. Leins.—p. 1054.

Interreno-Insular Syndrome.—Askanazy and Sciclounoff describe the clinical observations and the necropsy on a girl, aged 20. The clinical symptoms were edemas, severe atrophy of some of the organs, bradycardia, hypotension, hypothermia, hypoglycemia, ammenorrhea and dryness and pigmentation of the skin with lanugo formation. Since implantation of hypophyseal tissue had effected a certain improvement, a hypophyseal cachexia seemed possible. The necropsy, however, disclosed that this diagnosis was erroneous. There was hyperplasia of the adrenals, the pancreas was of normal size, but practically all other internal organs showed severe atrophy. The authors describe the histologic aspects of the organs, pointing out that the most noteworthy changes were detected in the pancreas, in that the number of its islands was greatly increased. This polynesia was found in all parts of the pancreas, the islands being about two and one-half times as numerous as is ordinarily the case. The structure of the islands was normal. The authors regret that they were unable to subject the enlarged adrenals to microscopic examination. In their interpretation of the pathologic observations they say that the adrenals and the pancreas are antagonistic, which would make a hypofunction of the adrenals seem logical in a case of polynesia. However, the pancreas and parathyroids are considered blood sugar reducing organs, and the thyroid, hypophysis and adrenals as blood sugar increasing organs. Since in this case the sugar reducing action was driven to the extreme, the organs that produce the blood sugar probably were overtaxed. The authors assume that this explains the hypertrophy of the adrenals. Moreover, if the action of the hypophysis is compensatory for the sugar reducing polynesia, it is understandable why the implantation of hypophyseal tissue effected some improvement. They discuss the case also from the point of view of a primary adrenal hyperplasia, pointing out that among the various pathologic manifestations of adrenal hyperplasia there are two types: those which seem to be the result of the increased production of adrenal hormones and those in which, in spite of the hyperplasia, a disordered or deficient hormone function seems likely. The clinical aspects of the described case contradict the first type, for it is usually accompanied by obesity, hypertension, hyperglycemia and so on. In the second type there develop signs of an intoxication which, particularly in the case of newborn infants, rapidly brings on a fatal outcome. The clinical picture of the latter type is usually that of a severe atrophy, which was the case also in the girl whose history is described; but in some respects this case deviated somewhat from the symptomatology of other cases. The authors concede that the question of a causal relation between primary polynesia and fatal cachexia cannot be definitely answered on the basis of this case. Nevertheless, there is an interrenopolynesic syndrome.

Clinica Chirurgica, Milan

38: 831-902 (Sept.) 1935

Relations Between Hepatitis and Cholecystitis. G. Gagliardi.—p. 831.
*Importance of Silk Suture in Genesis of Postoperative Peptic Ulcer. F. Paolucci.—p. 852.
Rare Tumors of Thyroid. A. Billi.—p. 863.

Silk Sutures and Postoperative Peptic Ulcer.—Paolucci performed in six dogs the operation of transmesocolic posterior gastro-enterostomy combined with pyloric exclusion according to Eiselsberg, using silk threads as suture material. In a second series of six dogs he severed the duodenum directly below the pylorus and closed the two stumps; he performed a transmesocolic posterior gastrojejunostomy according to von Hacker; he severed the duodenum below the entrance of the pancreatic duct and closed its distal end by a purse string suture, and he made a terminolateral anastomosis between the proximal end of the duodenum and the last loop of the ileus from 10 to 20 cm. from the cecum. Five dogs of the first series and four of the second survived the operation. Fifteen days after the operation, on histologic examination, one of the five dogs showed a small tissue loss without the characteristics of a true ulcer and the presence of a long silk thread in the shape of a loop. The tissues at the anastomotic suture points were slightly edematous and hyperemic. In the right anterior portion of the anastomosis in another dog, the author found a tag of omentum, markedly hyperemic and adhering to the stomach and to the jejunum. The tag occluded hermetically a small ulcer involving the anterior wall of the jejunum. No silk threads were observed on the margin of the ulceration. Numerous loops of silk thread were present at the lumen of the anastomosis without there being a trace of ulceration. Below the tag of hyperemic omentum there was a second round ulcer with clear cut margins about 3 cm. from the left angle of the anastomosis. Ulcers were found in the jejunum of each dog of the second series. In all the loss of substance was of variable size and the ulcers were always round and had clear-cut margins. They were always observed in the jejunum on the afferent or efferent loop at various distances from the anastomosis. In the two ulcers produced in the first series of dogs no suture thread was found, whereas at the sites of the sutures no ulcers were present. The ulcer produced on the afferent loop was at such a distance from the anastomotic stoma that it excludes any possible influence of the sutures. The ulcers present in the second group, constantly found in the jejunum on the afferent and efferent loop, could not be attributed to the presence of sutures, because the losses of substance were produced at a distance not only from the anastomosis but also from the loops of suture. The author concludes that there is no relation between postoperative peptic ulcer and the silk thread suture.

Riforma Medica, Naples

51: 1461-1500 (Sept. 28) 1935

Pathogenesis and Surgical Treatment of Muscular Torticollis in Adults. L. De Gaetano.—p. 1463.
Henry Flocculation Test in Diagnosis of Malaria. A. Costadoni.—p. 1467.
*Action of Irradiations from Lecithin on Development of Bacteria. G. Acanfora.—p. 1475.

Effect of Irradiations from Lecithin on Bacteria.—Acanfora proved that the radiations of lecithin that has been submitted to radiations of light inhibit the cultural development of certain fungi. His work was reported in the *Annali di medicina navale e coloniale* **41**:193 (March-April) 1935. The author repeated the experiments by subjecting cultures of bacteria, especially those of the Bacterium melitense group, to the same irradiations in order to ascertain whether or not they have the same action on the cultural development of bacteria as they have on that of fungi. He found that these irradiations have no action on the cultural development of bacteria, except in the case of bacteria of the paratyphoid and metadysentery groups. This different behavior of lecithin irradiations is due to the fact that fungi are less differentiated organisms than bacteria. While the irradiations have an inhibitive action on the former, the latter can stand it and even derive some benefit from it in certain cases.

Semana Medica, Buenos Aires

42: 1045-1120 (Oct. 10) 1935. Partial Index

Experimental Trichinosis in Rats. F. L. Niño.—p. 1045.
Treatment of Arterial Hypertension by Octyl Alcohol. C. Rossi Belgrano and E. Zucal.—p. 1073.
*Treatment of Trachoma by Diathermocoagulation. G. von Grolman.—p. 1080.
Pneumography of Breast. J. Benzadón.—p. 1085.
Modern Treatments of Exophthalmic Goiter and Hyperthyroidism. L. Goldemberg.—p. 1095.
*Painful Nodule of the Ear: Case. E. L. Othaz.—p. 1105.

Treatment of Trachoma by Diathermocoagulation.—Von Grolman states that diathermocoagulation is the surgical treatment of choice in trachoma. The scars it leaves in the palpebral conjunctiva are small and nonretractile. The operation is not complicated by entropion, symblepharon, hemorrhages and shock. It has a thrombotic and hemostatic action on the vessels of the operative field and causes sterilization of the tissues and complete destruction of the granulations. Its

technic is simple and rapid. Owing to the fact that there are several methods for graduation of the intensity of the currents, it is possible to determine the proper dose to be given and to repeat the operation whenever it is necessary.

Painful Nodule of the Ear.—Othaz makes a general study of painful nodules of the ear, in the etiology of which heredity, climate and nationality of the patient do not play a part, but trauma and the action of either heat or cold may. While infection is not the cause of the disease, it may complicate it. As a rule, it is a solitary unilateral growth seated at the helix. The predominant symptom is spontaneous or provoked intense pain of the neuralgic type, related to the congestive condition of the ear. Some relief is obtained by removing the little scar covering the nodule. The evolution is chronic. The differential diagnosis should be made with Darwin's tubercle (congenital malformation of the helix), verruca vulgaris, gouty tophus, cyst and epithelioma. The prognosis is good.

Archiv für Gynäkologie, Berlin

159: 585-741 (Oct. 10) 1935. Partial Index

*Clinical Aspects and Genesis of Brenner Tumors. E. Fauvet.—p. 585.
Cultivation of Trichomonas Vaginalis-Hominis and Its Transmission to Small Experimental Animals. H. Wittfogel.—p. 612.
Clinical Significance and Pathology of Ovarian Teratomas. Z. von Szathmáry.—p. 653.
Order of First Appearance and of Development of Ossification Nuclei of Foot in Intra-Uterine Fetus (So-Called Bone Age of Fetus). G. A. Baksceht and T. N. Siltschenko.—p. 701.
*Changes in Fat Metabolism Before Onset of Labor Pains During Normal Pregnancy: Contribution to Problem of Onset of Birth. G. Effkemann. —p. 718.

Genesis of Brenner Tumors.—Fauvet describes and discusses the histories of four women with Brenner tumors and then gives his attention to the genesis of these tumors. He evaluates the theories advanced by others in the light of his own observations. He emphasizes that the comparison between the endometrioses and the Brenner tumors should not go too far, insisting that the Brenner tumors are always of ovarian origin, whereas this cannot be said about the endometrioses. But, although always of ovarian origin, the Brenner tumors apparently may derive from various elements in the ovaries, either from Walthardt's cell foci, as Robert Meyer assumes, or from the ovarian rete, as is indicated by Schiller's and the author's own observations. In discussing the hormone aspects of the Brenner tumors, he emphasizes that in his cases he observed nothing which would justify the assumption that their development is regulated by ovarian hormones. On the contrary, he gained the impression that the development of the Brenner tumors is promoted by the subsidence of the ovarian function. In this connection he calls attention to von Behring's statement with regard to hemorrhagic metropathy, chronic cystic mastopathy and the endometriosis, which that author regards as "paramenstruations" and not as the result of hyperfunction, but rather of a dysfunction of the gonads, assuming that other substances might become active as the result of an insufficiency of the ovaries. The author says that the analysis of his own cases indicates that other than ovarian hormones play a part in cases of Brenner tumors. He gave his attention to the adrenal cortex but reaches no definite conclusion, since the knowledge about the functions of this organ is as yet incomplete.

Changes in Fat Metabolism and Onset of Birth.—Effkemann discusses the incretory changes that take place in the pregnant organism before the onset of labor and reports his own studies on the changes in the fat metabolism. He found that from three to six days before delivery the fatty acid content of the blood increases slightly over the values that are found during the second half of pregnancy. He observed values of from 700 to 850 mg. per hundred cubic centimeters. He further observed that the acetone bodies increase likewise before the onset of the labor pains. The acetonuria of pregnant women, which on the average amounts to 240 mg., commences to increase with the sixth day before delivery and reaches values of 640 mg. in the daily urine. The anterior hypophyseal hormone of the fat metabolism is slightly increased in the blood at this time.

Archiv für Verdauungs-Krankheiten, Berlin

58: 121-248 (Oct.) 1935. Partial Index

Gastritis. A. F. Hurst.—p. 121.
Significance of Catalase (and Triboulet) Reaction for Diagnosis and Prognosis of Intestinal Disturbances. S. Kemp and T. T. Andersen. —p. 144.
Autovaccines and Antivirus in Treatment of Chronic Colitis. D. Gutierrez Arrese, D. Lopez Blanco and J. M. Lastra.—p. 167.
*Palpatory Examination of Pancreas. J. W. Grott.—p. 181.

Palpation of the Pancreas.—Grott found that, if the patient lies on his back with the knees flexed and with a support under the lumbar portion of the vertebral column (either an arm or a sand sack, 8 or 10 cm. in thickness), greater relaxation of the abdominal walls can be obtained. The patient is examined first without the support under the lumbar vertebral column and then the examination is repeated with this support. At the beginning of the examination the examiner places the right hand on the abdomen in such a manner that the slightly bent fingers reach the external edge of the left abdominal rectus muscle. The fingers of the right hand are used for palpation, those of the left hand to exert the necessary pressure. The patient is told to breathe deeply and quietly so as to effect complete relaxation. During a deep inspiration the fingers of the right hand pressed by those of the left go deep down into the abdominal cavity. When the greatest depth has been reached, the external edge of the left rectus muscle is pushed aside and an attempt is made to reach the side of the vertebral column with the fingers of the examining hand. The examination must be made slowly and with precaution so as to avoid any painful pressure, which might result in an erroneous interpretation of the palpation. A roentgenologic control of the examination disclosed that the stomach recedes in the direction of the epigastrium in the course of the palpation. The author assumes that the intestines are also pushed aside. He advises that the palpation be begun not in the region of the pancreas itself but rather in the adjoining regions. He begins below the line that goes through the umbilicus. If this is done the patient becomes accustomed to the examination and, when the pancreas is reached, he is capable of differentiating between the sensation produced by the pressure of the hand and by pain in an organ. This method permits the detection of a pain to pressure at the site where the pancreas crosses the lumbar portion of the vertebral column and the abdominal aorta. The forward bending of the vertebral column makes its lateral surface larger, and the pressure of the diseased organ against this hard support elicits the pain symptom. The author made this examination in 101 patients, and palpation of the pancreas was possible in eighty-eight. Of the latter, thirty-two complained of pain, seventeen stating that the pain was severe and fifteen that it was mild. Further tests on the seventeen patients indicated that ten had a chronic inflammation of the pancreas, while in the other seven such a disorder could only be assumed.

Klinische Wochenschrift, Berlin

14: 1561-1592 (Nov. 2) 1935. Partial Index

*Use of Purified, Protein-Deficient Therapeutic Serums in Diphtheria Patients. A. Hildebrandt.—p. 1563.
*Psychic Behavior During Short Sojourn at Five Thousand Meter Elevation: Effect of Climate of High Altitude. J. Jongbloed.—p. 1564.
Functional Tests of Liver in Latent Hepatic Impairment. W. Ruhbaum and W. Matheja.—p. 1568.
Gonadotropic Hormone of Anterior Lobe of Hypophysis and Menstrual Cycle: Quantitative Determination of Sex Hormones in Healthy Persons and in Persons with Mental and Nervous Disorders. W. Österreicher.—p. 1570.
Composition of Blood and Elimination of Urine Following Administration of Fluids. W. von Moraczewski, S. Grzycki and T. Sadowski. —p. 1574.

Purified, Protein-Deficient Serums in Diphtheria.—Hildebrandt points out that it is known that pseudoglobulin is the carrier of the antitoxin. This knowledge is the basis for the purification of the serums, in that attempts were made to eliminate the other protein fractions that do not carry antitoxin. It proved possible to produce therapeutic diphtheria serums the protein content of which does not exceed 5 per cent. Animal experiments with protein-deficient serums indicated that the rapidity of resorption is inversely proportional to the protein content. For this reason it was assumed that the serums with low protein content are of especial therapeutic

value, because they fulfil one of the most important requirements of successful serum therapy; namely, rapid resorption. The author decided to compare the efficacy of the serum that is deficient in protein with that of native diphtheria serum. Another factor that induced him to try this treatment was that the protein-deficient serum might be important from the point of view of serum disease. He employed the two types of serum in alternate cases of diphtheria that came up for treatment. He used the serums in fifty-eight and fifty-seven cases, respectively. In each group there occurred five deaths. A tabular report indicates that 28 per cent of the group of patients who were treated with native serum and 20.7 per cent of the group treated with protein-deficient serum developed signs of serum disease. This rather high percentage for both groups is explained by the fact that the symptoms of serum disease were carefully watched for, so that probably none escaped observation. A comparison of the severity of the symptoms of serum diseases in the two groups disclosed that in the patients who had been treated with the protein-deficient serum the symptoms were on the whole somewhat milder than in the other group. The author is as yet unable to render a definite evaluation of the therapeutic value of the protein-deficient serum, but he maintains that he saw nothing indicating its inferiority to the native serum.

Psychic Behavior at High Altitudes.—Jongbloed investigated whether the oxygen deficiency would impair the alertness of an aviator flying at an altitude of 5,000 meters, pointing out that such heights occasionally are necessary when high mountains have to be crossed, particularly if cloudiness obscures the mountains. The alertness of the aviator is especially important in case of so-called blind flying that may be necessary on account of the cloudiness. The author found that the rarefaction of the atmosphere at the altitude of 5,000 meters causes only slight impairment of the mental alertness in the radio telegrapher. He found that the slowing down of the mental alertness was most noticeable in the choice reactions, the regularity being influenced more strongly than the duration of the reaction time. However, the author is convinced that a trained aviator can safely fly for about an hour at an altitude of 5,000 meters but that a further increase in the altitude decreases the alertness rapidly and, for instance, blind flying during bad weather makes higher demands on the alertness of the aviator. Three of the author's test subjects had to breathe oxygen shortly after an altitude of 5,000 meters had been reached, while four others had difficulties. This indicates that at this altitude difficulties may be encountered in passengers, for, although the aviators can be selected in air transportation, the passengers cannot. Accordingly it is necessary to take measures so that air transportation will not cause difficulties even in the weakest of the passengers. The author states that an oxygen supply should be available for altitudes of more than 5,000 meters. However, he thinks that breathing-masks and other instruments are likely to alarm the passengers and should be avoided. He thinks that since the cabin of a modern plane has a regulable ventilation system, it would probably be possible to keep the oxygen tension high enough by forcing in a supply of oxygen.

Medizinische Klinik, Berlin

31: 1385-1420 (Oct. 25) 1935. Partial Index

Indications for and Results of Irradiation in Tuberculosis of Lymph Nodes. G. von Pannewitz.—p. 1394.
*Impairment of Heart by Roentgenotherapy. G. W. Parade.—p. 1396.
Differential Diagnosis of Ureteral Calculi. F. Kerschner.—p. 1397.
Papillary Cystocarcinoma of Thyroid in Girl, Aged 14. F. Krieglstein.—p. 1399.
*Special Form of Staphylococcic Infection of Leptomeninges. A. Ghon and Maria Mittelbach.—p. 1403.
Cutaneous Pigmentation and Roentgen Irradiation. J. Borak and D. Eisenklammn.—p. 1405.

Impairment of Heart by Roentgenotherapy.—Parade says that in 1933 he called attention to exacerbations of thyrotoxic cardiac disturbances following roentgenotherapy of the thyroid. He reports the histories of two patients whom he observed recently and in whom roentgenotherapy was followed by disturbances in the cardiac rhythm. The first patient was a man, aged 42, who had mitral stenosis and who was subjected to roentgenotherapy of the right lower field of the lung because of a suspected tumor. At first the irradiations given at intervals of two or three days were well tolerated, but considerable acceleration of the pulse and severe arrhythmia developed a few hours after the last irradiation. Electrocardiography disclosed auricular fibrillation and absolute arrhythmia of the ventricles. The arrhythmia proved extremely refractory; it did not yield to treatment with large doses of quinidine, but later it was somewhat improved by digitalis. The second case was that of a woman, aged 58, who likewise had mitral stenosis and developed auricular fibrillation and absolute arrhythmia following the roentgen irradiation of a carcinoma of the uterine cervix. The anamneses of both these patients revealed that the mitral stenosis had caused practically no discomfort previous to the roentgenotherapy. In view of the fact that the arrhythmia developed in both patients immediately after the irradiation, the author assumes a connection between the two. It is noteworthy that in the one patient the heart had been directly exposed to the rays, whereas in the second case the action must have been indirect. The author assumes that substances liberated in the course of the roentgenotherapy might exert their harmful effect on the heart or on the centers regulating it. He cites the case of a woman with polycythemia rubra, in whom the long tubular bones had been irradiated with roentgen rays and who had developed a threatening auricular flutter. This case was somewhat more complicated in that the flutter responded to quinidine treatment, but ten days later a fatal coronary thrombosis developed. The author concludes that great precaution is necessary if roentgenotherapy is employed in patients with heart disease.

Staphylococcic Infection of Leptomeninges.—Ghon and Mittelbach describe a case of staphylococcic meningitis which is noteworthy because of its macroscopic and histologic aspects. The case had been diagnosed clinically as meningo-encephalitis and cardiac and aortic defect. The primary disorder had been an ulcerous endocarditis, and death was caused by septicopyemia. Histologic examination of the brain disclosed recent meningo-encephalitis with abscess formation. The majority of the abscesses contained bacteria either in the form of emboli or in clumps free in the tissues. Evaluation of the various aspects indicates that the process was a septicopyemia caused by Staphylococcus pyogenes-aureus which originated in a recurring, ulcerous-polypous endocarditis of the aortic valves and led to hematogenic metastases in the liver, kidneys, ileum, epicardium, brain and leptomeninges. The case is especially noteworthy because of the anatomic aspects of the leptomeninges, which contained small and miliary abscesses with hemorrhagic areolas at the convexity of the cerebrum and in the cerebellum. With the exception of small hemorrhages in the cerebellum, which indicated encephalitic foci, the brain was free from encephalitic signs. The author is convinced that the abscesses in the leptomeninges are hematogenic metastases of the endocarditis. This form of hematogenic, metastatic infection of the leptomeninges is unusual and for that reason noteworthy, for the metastatic infiltrations of the brain in case of acute infections usually appear in the form of abscesses in the cortex and medulla. The reported case contradicts the statement of Spatz, according to which the meningitic foci develop as the result of the encephalitic ones, that is, secondarily, for the histologic aspects of this case justify the assumption that the encephalitic foci were caused by the leptomeningitis either by direct transition or by way of the vessels and possibly also partly by the hematogenic route from the endocarditis.

Zeitschrift f. Geburtshülfe u. Gynäkologie, Stuttgart

111: 273-416 (Oct. 22) 1935. Partial Index

Studies on Function of Uterine Muscle. L. Kraul.—p. 273.
Studies on Susceptibility to Solution of Pituitary of Musculature of Human Uterus in Surviving Organ. K. Podleschka.—p. 293.
*Thyroid Therapy of Preeclampsia and Modification of Basal Metabolism During Preeclampsia and Pregnancy. H. Dietel.—p. 326.
Missed Abortion: Histologic Examination of Embryo, Dead for Several Weeks in Uterus and Then Removed by Operation. G. Ilberg.—p. 336.
*Pathologic Histology of Tumors of Breast. H. Limburg.—p. 353.

Basal Metabolism During Pregnancy and Preeclampsia.—Dietel shows that the basal metabolic rate is increased in the majority of pregnant women and that this increase disappears again during the puerperium and remains constant after it. Thyroid substance or its preparations are incapable of further increasing the heightened basal metabolic rate of

pregnant women. It is probable that the thyrotropic hormone of the anterior lobe of the hypophysis plays an important part in the heightened metabolic rate during pregnancy. In preeclamptic patients the basal metabolic rate is lower than in normal pregnant women, but it is impossible to compensate for this reduction by the administration of thyroid substance or of thyroxine. These observations show that the actions of thyroid preparations, particularly their effect on the basal metabolism, are reduced during pregnancy and preeclamptic and eclamptic conditions. The author points out that this explains the high tolerance for thyroid preparations in healthy pregnant women and in those with preeclampsia. He says that this resistance to thyroid preparations is being further investigated in order to find a better treatment for the preeclamptic conditions.

Histology of Tumors of Breast.—Limburg shows that in the great variety of histologic pictures of mammary tumors there are borderline cases that stand between benign tumors and malignant ones. At his clinic thirty-two such cases came under observation (in addition to 784 unsuspected cases) within the last ten years. He describes eighteen cases in which the histologic examination of the exploratory excision did not permit a definite prognosis. Only three of these patients were subjected to a radical operation (amputation of breast and removal of axillary glands), but all were kept under clinical observation and during a period of from one to six years all remained free from relapse. In view of this observation and although he is aware of the fact that the number of cases is rather small, the author thinks that a malignancy index of from 25 to 50 per cent is too high for cases of cystic breast and that the epithelial proliferations do not deserve the unfavorable estimation to which they are generally subjected.

Zeitschrift für Krebsforschung, Berlin

42: 347-448 (Sept. 21) 1935. Partial Index

Influence Exerted by Male Gonads on Taking and Growth of Transplantation Tumors. E. Pribram.—p. 368.
Influence of Diet on Growth of Inoculation Tumors: Influence of Zigzag Diet. G. F. De Gaëtani.—p. 373.
*Attempt at Bacteriotherapeutic Modification of Course of Tar Cancer. L. H. Peretz, A. I. Newler and L. T. Larionow.—p. 417.
*Does Cancer Mortality Increase? H. Schwarz.—p. 426.

Bacteriotherapy of Tar Cancer.—After calling attention to previous studies with colon bacilli, Peretz and his associates describe further studies which they made on sixty-two mice with tar cancer. Observations made in the course of these studies on the treatment of tar cancers with coli agar revealed that (1) in a number of cases this treatment cleanses the cancer wound surface, inhibits the crust formation and prevents suppuration; (2) occasionally it produces a certain inhibition of the growth of the tumors; (3) it seems to prolong the life of the mice with extremely large tumor wounds. Studies were made also on the microflora of the tar cancer and on its modification by the coli therapy. Tests that were made before the onset of the bacteriotherapy revealed in many cases streptococci and staphylococci, in some cases Bacillus proteus and in others sporogenic bacteria. However, the most frequent microflora were gram-negative organisms that belong to the coli group. The authors refer to them as the "tar cancer bacilli." Tests made in the course of the coli therapy revealed that it counteracts to a great extent the staphylococci, streptococci, sporogenic bacilli and other microbes but that it exerts only a slight influence on the "tar cancer bacilli." Experiments in vitro corroborated these observations. In further studies they attempted to find an antagonist to the "tar cancer bacilli," but without success, for the experiments proved that coli therapy represents the most effective antagonist. Attempts to counteract the resistant "tar cancer bacilli" with a polyvalent antivirus failed likewise. In summarizing their observations, the authors reach the conclusion that the favorable action of coli therapy on tar cancer is due to the fact that it vigorously counteracts the staphylococci, streptococci and other micro-organisms and that it influences the "tar cancer bacilli" at least slightly. They hope that coli therapy will eventually be applicable in human beings, particularly in those with cancer of the intestinal tract.

Cancer Mortality.—Schwarz analyzes the cancer statistics of Czechoslovakia, which indicate a great increase in cancer mortality in recent years. He shows that this increase is apparent rather than real, it being accounted for partly by the predominance of the higher age groups and partly by the fact that a larger number of cancers are now recognized than was formerly the case. The importance of the latter factor is proved by the fact that the increase in cancer mortality is especially great in the eastern portion of Czechoslovakia, where formerly lay persons gave the cause of death in a larger number of cases than is the case today. As this part of the country becomes better supplied with physicians and hospitals, cancer is more often recognized as the cause of death. A comparison of the cancer statistics of recent years with those of the previous ones indicates that the increase in mortality from cancer is largely explained by the decrease in such diagnoses as death from "old age" and from other indefinite causes.

Vestnik Khirurgii, Leningrad

40: 1-270 (Nos. 112-113) 1935. Partial Index

Morbidity and Mortality of Appendicitis. I. M. Rokhkind.—p. 15.
Anatomopathologic Aspects of Acute Appendicitis. G. V. Shor.—p. 34.
*Data Regarding Time of Operation in Acute Appendicitis. M. V. Krasnoselskiy.—p. 45.
*Treatment of Indurative Stage of Acute Appendicitis. B. G. Stuchinskiy.—p. 60.
*Acute Appendicitis in Children. V. A. Shaak.—p. 99.
Appendicitis in the Aged. N. D. Kamenskaya.—p. 113.
Erythrocyte Sedimentation Test in Acute Appendicitis. E. P. Chernyaeva.—p. 158.
*Operative Treatment of Appendiceal Peritonitis Without Drainage. M. V. Krasnoselskiy.—p. 193.

Time of Operation in Acute Appendicitis.—Krasnoselskiy studied 1,944 cases of acute appendicitis from the point of view of operative indications at various stages after the onset of the attack. The study of the pathologic alterations in the appendix demonstrated that neither the time elapsed since the onset of the acute attack nor the clinical picture made it possible to estimate the underlying pathologic condition of the appendix and of the adjacent structures. The prognosis cannot be established with any degree of certainty on these data. The author therefore believes that operation is indicated as soon as the diagnosis is made, regardless of the time elapsed or of the degree of severity of the clinical symptoms. Conservative treatment is permissible only in cases with well defined palpable induration, provided the patient is kept under observation in the surgical division. The incidence of acute appendicitis in women was less than in men. It ran a milder course and its mortality was about one third that occurring in men. The deciding factor in mortality was not the time element and the consequent loss of immunobiologic properties of the organism, but the pathologic alteration in the appendix and the surrounding structures. Comparison of a series of 500 cases up to January 1933 with a series of 1,444 cases from Jan. 1, 1933, to July 15, 1934, showed that the mortality was lowered from 3.2 per cent to 1.8 per cent. The mortality for the two series was 2.16 per cent: 3 per cent in men and 1.12 in women.

Indurative Stage of Acute Appendicitis.—Stuchinskiy analyzed the 172 cases of appendiceal abscess occurring in 1,944 cases of acute appendicitis admitted to the Leningrad Institute for Quick Aid. Of these, 54 per cent occurred in women and 46 per cent in men. The average day of admission for cases complicated with a tumefaction was the sixth. The causes for tardy reference to the hospital were (1) delayed or erroneous diagnosis in 33 per cent, (2) attempt at conservative treatment at home, because of an impression that surgical intervention was not indicated, in 32 per cent, and (3) refusal of hospitalization or operation in 30 per cent. Patients admitted to the institute in the stage of tumor formation were treated conservatively. In the absence of signs of peritoneal inflammation the treatment was limited to rest and the application of heat. Spontaneous absorption of the induration took place in 141, or 83 per cent, of the cases, usually on the twelfth to the thirteenth day. In twenty-seven the induration went on to suppuration. Operation was performed in these cases. It consisted of incising the abscess and draining without opening the peritoneal cavity or attempting to remove the appendix. There were three fatalities among the 172 cases (1.7 per cent). The follow-up study for the next two years revealed 32 per cent of recurring attacks. Emergency operation was performed in 18 per cent. Because of persistent pains, 14 per cent of the patients were

operated on in the cold stage. The examination of the removed appendixes showed that this structure persisted in 97 per cent of the cases. The author therefore believes that the appendix should be removed in the interim stage following the recovery from an appendiceal abscess.

Acute Appendicitis in Children.—Of 140 cases of acute appendicitis in children reported by Shaak, 58 per cent were in boys and 42 per cent in girls. Acute appendicitis in children runs a more severe course than in adults and gives a higher mortality. The total in this series was 8.5 per cent; for cases of later stages it ranged from 16 to 20 per cent. The younger the child the more serious the prognosis, the mortality for those less than 3 years of age amounting to 20 per cent. The pathologic alterations in the appendix and in the peritoneal cavity develop with great rapidity, and perforation may occur earlier than twelve hours after the onset. The diagnosis in young children is difficult, and errors are more frequent than in adults. Pneumonia furnishes a high percentage of diagnostic errors. The operative indications are the same as in adults; the insistence on an early operation, however, must be even more urgent here because of the rapid progression of the process. The author advocates operative intervention in any stage of acute appendicitis, even after forty-eight hours, if the symptoms are not abating.

Treatment of Appendiceal Peritonitis Without Drainage.—Krasnoselskiy analyzed the 1,944 cases of acute appendicitis in which operation was performed in the Leningrad Institute for Quick Aid between May 1932 and July 1934, with especial consideration of the results obtained with the method of closing the peritoneal cavity without drainage. He shares the view of many authors that the general peritoneal cavity cannot be drained and that therefore the drain is superfluous and at times injurious. If the appendix has been removed, the bleeding arrested and peritonization complete, there exist no indications for drainage. This postulate is not influenced by the character of the exudate, by the existence of gangrene or perforation of the appendix, or by the time elapsed since the onset of the attack. Local drainage with the view of isolating the focus of infection from the rest of the peritoneal cavity is indicated in the presence of a suppurating area denuded of peritoneum, in failure to remove the appendix, in improperly carried out appendectomy, or in the presence of a raw, oozing surface. In a series of 950 cases of purulent appendicitis, 98 per cent were closed without drainage. In a series of 360 cases of gangrene or perforation of the appendix, 67 per cent were closed without drainage. The percentage of drained cases in a total of 1,330 severe purulent appendicitis cases was 10.5. With regard to the character of the exudate, local drainage was practiced in 3.7 per cent of the seropurulent type, in 30 per cent of the purulent and in 54 per cent of the cases with abscess formation. Residual abscesses were less frequent when drainage was omitted. The incidence of abscess of the pouch of Douglas in the series in which drainage was not practiced was 3.3 per cent, while in the series in which it was practiced it was 7.8 per cent. Abscess on the left side was seen in 0.34 per cent of the cases in which drainage was not done and in 2.16 per cent of the cases in which drainage was done. There was only one case of subdiaphragmatic abscess, and that occurred in the drained series. Mortality in the series in which drainage was not practiced was 1.5 per cent, while in the other series it was 17 per cent. The analysis of the twelve fatalities occurring in the series in which drainage was omitted shows that only seven patients died as the result of spreading peritonitis that was already present at the time of operation.

Bibliotek for Læger, Copenhagen

127: 343-381 (Oct.) 1935

*Familial Occurrence of Chronic Suppurative Coloproctitis. O. Moltke.—p. 343.
*Hyperproteinemia (Late Diagnosis of Myeloma, the Formol-Gel Reaction, Bence Jones Proteinuria and Kidney Lesion): Case. J. Bing.—p. 354.
*Hyperglobulinemia with Disturbance of Central Nervous System on Toxi-Infectious Basis (Myelitis, Polyradiculitis, Changes in Spinal Fluid): Two Cases. J. Bing and A. V. Neel.—p. 369.

Chronic Suppurative Coloproctitis.—The malignant (ulcerous) form of this disorder appeared in two of the five families described by Moltke, and a more benign form in the other three. He says that familial occurrence of the disorder is suspected in four additional families, but verification of the diagnosis has been impossible for various reasons. Transmission by infection from one member of a family to another is regarded as quite improbable in most cases of suppurative coloproctitis.

Hyperproteinemia.—After repeated examinations, myelomas were finally demonstrated in one of Bing's three cases of hyperproteinemia, in patients aged from 56 to 59, but could not be confirmed roentgenologically in the other two. In the second case the diagnosis was verified after sternal puncture and on necropsy. The third patient continues under observation. The hyperproteinemia, in all cases a hyperglobulinemia, was indicated by a marked increase in the sedimentation reaction (from 75 to 159 mm. in one hour), and the formol-gel reaction was positive in these cases but negative in serum from normal patients and patients with other disorders. There were renal lesions in all three cases, with elimination of large amounts of Bence-Jones protein in one case. Examination of the relative albumin percentage in the urine containing Bence-Jones protein showed considerable variations depending on the total protein content, and the proteinuria varied with the creatinine clearance independently of the diuresis, as previously shown in ordinary proteinuria and cholesteroluria.

Hyperglobulinemia.—Bing and Neel describe two cases of marked hyperglobulinemia associated with pronounced changes in the central nervous system, such as myelitis and polyradiculitis, and changes in the spinal fluid. The patients subsequently evinced a high rate of erythrocyte sedimentation and a positive formol-gel reaction. Infections were present in both instances. The authors assert that these cases present a picture not previously reported.

Finska Läkaresällskapets Handlingar, Helsingfors

77: 527-588 (Sept.) 1935

Phlyctenular Diseases of Eye and Their Relation to Tuberculosis and to Some Ectoparasites and Endoparasites. O. Heinonen.—p. 527.
*Puncture of Bone Marrow, with Especial Reference to Bone Marrow in Pernicious Bothriocephalus Anemia. G. Tötterman.—p. 547.
*Grave Pseudoparalytic Myasthenia in Child Aged 2. L. Grönlund.—p. 559.

Puncture of Bone Marrow.—Tötterman considers Arinkin's method for intravital examination of the bone marrow the simplest procedure and uses it. In a typical case of cryptogenic pernicious anemia the bone marrow punctate was characterized by marked increase in the nucleated red blood corpuscles, 286 to 400 white, a large part consisting of promegaloblasts and megaloblasts. The number of reticulocytes in the punctate was the same as in the blood. In two cases of pernicious bothriocephalus anemia the bone marrow showed changes similar to those in the case of cryptogenic anemia, the resemblance between these two forms of pernicious anemia thus extending to the changes in the bone marrow. The difference between the blood and the bone marrow pictures in a case of chronic lymphatic leukemia and one of untreated chronic myeloid leukemia was slight. In a patient with a low leukocyte count in the blood more than 90 per cent myeloblasts were demonstrated in the bone marrow; after some weeks the blood presented the typical picture of acute myeloid leukemia.

Pseudoparalytic Myasthenia in Child.—Grönlund says that the characteristic symptoms of ptosis and strabismus marked the onset in this case, and the chronic course, remissions, aggravation after five months with difficulty in chewing and swallowing, weakness in the muscles of the neck, indistinct articulation and greater intensity of the symptoms in the evening than in the morning pointed to a typical myasthenia. Three months' hospitalization with rest in bed for about two months and general strengthening treatment resulted in improvement. The history of occasional strabismus on the part of the child's father and brother afforded the only suggestion of a constitutional etiologic factor. The low values found in the sugar loading and epinephrine tests point to a disturbance in the carbohydrate metabolism and tend to support the hypothesis that the cause of myasthenia depends on disturbances in the endocrine system.